



98th NARST International Conference | Digital Program

March 23 - 26, 2025



In Praise of Science Teachers: Essential Partners in **Researching, Reframing,** **and Reforming** Science Learning

Washington, DC

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98th NARST International Conference



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and [here](#) for updates.

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98th NARST International Conference

General Information

Information about NARST

NARST is a global organization for improving science teaching and learning through research. Since its inception in 1928, NARST has promoted research in science education and the communication of knowledge generated by the research. The ultimate goal of NARST is to help all learners achieve science literacy.

The Association is incorporated as a non-profit corporation in the State of Minnesota. The official publication is the *Journal of Research in Science Teaching* (*JRST*). NARST encourages presentations of a wide variety of investigations in all aspects of science education, including action, historical, philosophical, ethnographic, experimental, and evaluative research studies. Reports of empirical research, critical reviews, and theoretical works are encouraged. In October 2010, to reflect the Association's growing international focus and membership, the Board approved referring to the Association by its acronym only. At the April 2011 Board Meeting, the tagline for the Association was approved by the Board. Thus, the Association's name and tagline is:

NARST—A global organization for improving science education through research.

Research areas of interest to NARST members include curriculum development and organization, assessment and evaluation, learning theory, teacher education, programs for exceptional students (special needs and talents), equity studies, policy, and methods of teaching.

NARST Mission Statement

NARST is a global organization of professionals committed to the improvement of science teaching and learning through research. Since its inception in 1928, NARST has promoted research in science education and the communication of knowledge generated by the research.

The ultimate goal of NARST is to help all learners achieve science literacy. NARST promotes this goal by: **1)** encouraging and supporting the application of diverse research methods and theoretical perspectives from multiple disciplines to the investigation of teaching and learning in science; **2)** communicating science education research findings to researchers, practitioners, and policy makers; and **3)** cooperating with other educational and scientific societies to influence educational policies.

Member Benefits

- Ten issues per year of the *Journal of Research in Science Teaching* (electronic version), with access to [**JRST online**](#) through Wiley InterScience.
- Access to the [**NARST Member Forum**](#). Stay connected and informed of NARST activities, position openings, committee and Research Interest Group events, graduate student events, and more.
- Discounted registration rate for the NARST Annual International Conference.
- Opportunities to apply for [**scholarships and travel support**](#).
- Access to [**NARST Virtual Events**](#) throughout the year. We encourage members to propose webinars, workshops, and other virtual events that align with NARST's mission. Committees, RIGs, strands, and NARST leadership offer events for members free of charge.
- Opportunities to volunteer for [**committees**](#) and [**leadership positions**](#).
- Opportunities to serve as a mentor for new members and early career scholars: [**Sandra K. Abell Institute**](#), [**Mentor/Mentee Nexus**](#), and more.



NARST

A global organization for improving
science education through research

NARST Programs and Events Code of Conduct Policy

NARST is committed to providing a safe, productive, and welcoming environment for all meeting participants and NARST staff. All participants, including, but not limited to, attendees, speakers, volunteers, exhibitors, sponsors, staff members, and all others are expected to abide by this Programs Code of Conduct. This Policy applies to all NARST meeting-related events, including those sponsored by organizations other than NARST but held in conjunction with NARST events, on public or private platforms.

Unacceptable Behavior is defined as:

- Harassment, intimidation, or discrimination in any form.
- Verbal abuse of any attendee, speaker, volunteer, exhibitor, sponsor, NARST staff member, other meeting guest or venue staff member.
- Examples of verbal abuse include, but are not limited to, verbal comments related to gender, sexual orientation, disability, physical appearance, body size, race, religion, national origin, inappropriate use of nudity and/or sexual images

in public spaces or in presentations, or threatening or stalking any attendee, speaker, volunteer, exhibitor, NARST staff member, service provider, other meeting guest, or venue staff member.

- Disruption of presentations during sessions, in the exhibit hall, or at other events organized by NARST throughout the meeting.
- Participants should not copy or take screen shots of Q&A or any chat room activity that takes place in the virtual space.

NARST reserves the right to take any action deemed necessary and appropriate, including immediate removal from the meeting without warning or refund, in response to any incident of unacceptable behavior, and NARST reserves the right to prohibit attendance at any future meeting, virtually or in person.

If you experience harassment or hear of any incidents of unacceptable behavior, NARST asks that you inform either NARST Executive Director, Mackenzie Kelley, ExecutiveDirector@narst.org or NARST Events Manager, Amy Sellheim Amy.Sellheim@management-hq.com so that we can take the appropriate action.

Code of Ethical Conduct

The purpose of the National Association of Research in Science Teaching (NARST) Code of Ethical Conduct is to articulate a set of aspirational principles to guide and support members as they engage in professional activities—research, teaching, and service. NARST members are science education professionals who include researchers, practitioners, and graduate students from various cultures worldwide. These aspirational principles align with and support the mission of the organization to help all members achieve, develop, and contribute meaningfully to the improvement of science teaching and learning through research. NARST expects its members to adhere to the highest ethical standards. The Code of Ethical Conduct serves as a guide to the everyday professional conduct of science educators.

Unfamiliarity with NARST's Code of Ethical Conduct is not a valid defense for engaging in or failing to challenge observed unethical behavior. We accomplish this through our Code of Ethical Conduct where there is:

A. Professional Competence

Science education professionals strive to maintain the highest levels of competence in their work; they recognize the limitations of their expertise; and they undertake only those tasks for which they are qualified by education, training, or experience. They recognize the need for ongoing education in order to remain professionally competent; and they utilize the appropriate scientific, scholarly, professional, technical, and administrative resources needed to ensure honesty and integrity. Science education professionals conduct research, teach, practice, and provide service only within the boundaries of their competence, based on their education, training, supervised experience, or appropriate professional experience. They consult with other professionals when necessary for the benefit of their students, research participants, and clients. They maintain awareness of current scientific, scholarly, and professional information in their fields of activity and undertake continuing efforts to maintain competence in the skills they use. Importantly, professional competence must also include a willingness to accept

and integrate new information and experiences, regardless of the effect that process has on research outcomes.

B. Integrity

It is the social responsibility of science education professionals to maintain integrity in all conduct, publications, and forums, and give due credit to the contributions of others. Adhering to this standard means science education professionals do not fabricate, falsify, or plagiarize. Public comments on matters of importance that are relevant to science education must be made with care and accuracy. Adhering to this standard means science education professionals do not use deficit language, deceptive statements concerning research data, or otherwise knowingly make false, misleading or deceptive statements in practicing and presenting research. Comment and debate within the bounds of collegiality and professionalism that keep the organization moving forward and current with emergent issues and perspectives are encouraged. Adhering to this standard means science education professionals do not use dismissive remarks or gestures, restrict multiple voices, or use derogatory language. In short, science education professionals conduct their professional activities in ways that engender trust and confidence.

C. Professional and Scholarly Responsibility in Science Teaching, Learning, and Research

Science education professionals have a responsibility to use research practice and policy to advance NARST members' understanding of the teaching and learning of science in all learning contexts—formal, informal, local, and global—through research, practice, and policy. They adhere to the highest scholarly and professional standards within their field of expertise and accept responsibility for adherence to those standards. Science education professionals should regard the tutelage of graduate students and early career faculty as a trust conferred by the organization for which they work, as well as NARST, for the promotion of these individuals' learning and professional development.

Science education professionals understand that they form a community and show respect for other science education professionals even when they disagree on theoretical, methodological, or personal approaches to professional activities. In activities involving marginalized populations, it is essential that responsible science education professionals seek out the voices and experiences of members of these groups and treat them as critical to their scholarship. While always endeavoring to be collegial, science education professionals must never let the desire to be collegial outweigh their shared responsibility for ethical behavior. When appropriate, they consult with colleagues, NARST's Equity and Ethics Committee, or organizational entities such as their institutional review board in order to prevent, avoid, or challenge unethical conduct.

D. Respect for People's Rights, Dignity, and Diversity

Science education professionals respect the rights, dignity, and worth of all people in their professional activities. They treat other professionals, students, research participants, and members of the organization fairly, respectfully, and without exploitation or harassment. Science education professionals acknowledge the rights of others to hold values, attitudes, and opinions that differ from their own and take reasonable steps to avoid harm to others in the conduct of their work. They learn with others, share ideas honestly, give credit for others' contributions, and encourage others to contribute their unique skills, knowledge, and interests in professional environments. Science education professionals are sensitive to cultural, individual, and role differences in teaching, studying, and providing service to groups of people with distinctive characteristics, as well as the power differential that might result from such differences.

Science education professionals carefully avoid discrimination and bias toward individuals and groups based on race, gender, age, religion, ethnicity, nationality, sexual orientation, gender

expression, gender identity, presence of disabilities, educational background, socioeconomic status, or other personal attributes. They refrain from making biased assumptions about others and perpetuating demeaning attitudes and stereotypes. Science education professionals do not accept any forms of discrimination and actively challenge implicit and explicit forms of discrimination.

E. Social Responsibility

Science education professionals are aware of their scientific and professional responsibility to the communities and societies in which they live. This awareness extends to their involvement and service to an increasingly diverse and international NARST community. NARST members are guided by the values and standards that reflect the professional literature. They strive to promote equity and the public good by advancing scientific and scholarly knowledge. Science education professionals are aware of the differences in society and culture that impact scholarly knowledge and academic work. They value and embrace the public trust in research and teaching and are concerned about their ethical behavior and the behavior of other science education professionals that might compromise that trust. Science education professionals should reasonably expect of themselves and others to be guided by a code of ethics that supports efforts to resolve ethical dilemmas.

References

AERA Council. (2011). Code of ethics: American Educational Research Association. *Educational Researcher*, 40(3), 145-146.

American Sociological Association. (1999). Code of ethics and policies and procedures of the ASA committee on professional ethics. Retrieved from:

<http://www.asanet.org/membership/code-ethics>

American Psychological Association. (2017). Ethical principles of psychologists and code of conduct. Retrieved from:

<https://www.apa.org/ethics/code/>

Research Interest Groups (RIGs) Information

Continental and Diasporic Africa in Science Education RIG (CADASE)

The purpose of CADASE RIG is to **(a)** encourage science educators to engage in research aimed at meeting the needs of people of African descent; and **(b)** provide intellectual, professional, and personal space for science educators engaged in such research. This RIG will provide opportunities for science education researchers to integrate the study of culture, ethnicity, gender, race, and social class as lenses for performing critical analyses and evaluations of prevailing theory and practice of science education on the lives of people of African descent. A variety of theoretical and methodological frameworks will be used to address issues in science curriculum, learning, teaching, assessment and evaluation, and policy issues in both K-14 formal and informal venues in different contexts.

Chair: **Rona Robinson-Hill**

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Secretary: **Romola Bernard**

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Treasurer: **Stanton Bedford**

sbedford@utsouthern.edu

LATINO/A RIG (LARIG)

The Latino/a RIG supports social networks that further research agendas regarding Latino/a science learners. LARIG also serves as a support and mentoring alcoba (space) for Latin@s/Latino science educators and others interested in Latin@ science education.

Chair: **Angela Chapman**

Angela.chapman@utrgv.edu

Contemporary Methods for Science Education Research

The broad purpose of this RIG is to advance the mission of NARST by maintaining the rigor of science education studies, as well as promoting more standardized research practices across the organization such that we are better able to learn from and synthesize each other's work. The intent is that these outcomes will, in turn, allow us to keep advancing the field and maintain the relevance of our research to improving science teaching and learning.

Chair: **Robert Talbot**

robert.talbot@ucdenver.edu

Co-Chair: **Bina Vanmali**

bina@asu.edu

Engineering Education RIG (ENE-RIG)

The purpose of the RIG in Engineering Education is to synergize research in science and engineering education, promote rigorous research in engineering education, and provide a collaboration and discussion space supporting intellectual and professional exchange and networking.

Chair: **Monica Cardella**

mcardell@fiu.edu

Indigenous Science Knowledge

Research Interest Group (ISK-RIG)

The ISK-RIG was set up to showcase and provide support to current and future research works of a growing number of Indigenous Knowledge Systems (IKS) researchers working within indigenous communities throughout the world who are members of NARST. This group includes active members from Africa and the African Diaspora, Alaska, Australia, Canada, Indigenous populations of the Americas, Asia and the Pacific, the Middle East, Thailand, Nordic Regions, New Zealand, Scandinavia, the West and East Indies, etc. The goal is to increase awareness of what indigenous knowledge systems can contribute to research.

Chair: **Sharon Nelson-Barber**

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Research in Artificial Intelligence-Involved Science Education (RAISE)

This RAISE RIG aims at employing AI to extend the landscape of science education, increase the capacity of all participants in the venture to face worldwide challenges, and significantly address the equity and ethical problems in the world broadly. This RIG will **(a)** support cutting-edge innovations using AI to address learning, teaching, assessment, equity and policy issues in science education; **(b)** communicate the cutting-edge research involving AI to all researchers, practitioners, and policymakers; and **(c)** encourage junior scholars in the field to pursue AI innovations within science education research as it is broadly practiced.

Chair: **Xiaoming Zhai**

Xiaoming.zhai@uga.edu

Co-Chair: **Kent J. Crippen**

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Asian and Pacific Islander Science

Education Research (APISER)

The APRSER RIG will promote diversity, equity, and inclusion in science education research using the lenses relevant to Asian and pacific islander cultures, ethnicities, gender, and class, as well as the intersections of these markers. It will also serve as an intellectual network to support and mentor current and future Asian and Pacific Islander scholars within and outside of the United States, including NARST members interested in API related research endeavors.

Dr. Hosun Kang

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Dr. Edna Tan

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Lesbian, Gay, Bisexual, Transgender, Queer, Plus Science Education Research Group (LGBTQ +)

This RIG provides opportunities for science education researchers to explore and discuss issues relevant to the LGBTQ+ community related to a wide range of topics including science curriculum, learning, teaching, assessment or evaluation, and policy issues in both K-16 formal and informal educational contexts. RIG members promote diversity, equity, and inclusion in science education and science education research. The LGBTQ+ RIG serves as a peer support, mentoring, and inclusive space for folks who identify as LGBTQ+. The LGBTQ+ RIG provides a formalized space inclusive of queer folk and queer research.

Dr. Sara Porter

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Strand Key and Strand Coordinators

Strand Key

Strand 1:	Science Learning: Development of Student Understanding
Strand 2:	Science Learning: Contexts, Characteristics, and Interactions
Strand 3:	Science Teaching—Primary School: Characteristics and Strategies (Grades PreK-6)
Strand 4:	Science Teaching—Middle and High School: Characteristics and Strategies (Grades 5-12)
Strand 5:	College Science Teaching and Learning (Grades 13-20)
Strand 6:	Science Learning in Informal Contexts
Strand 7:	Pre-service Science Teacher Education
Strand 8:	In-service Science Teacher Education
Strand 9:	Discontinued
Strand 10:	Curriculum, Evaluation, and Assessment
Strand 11:	Cultural, Social, and Gender Issues
Strand 12:	Technology for Teaching, Learning, and Research
Strand 13:	History, Philosophy, Sociology, and Nature of Science
Strand 14:	Environmental Education and Sustainability
Strand 15:	Policy, Reform and Program Evaluation

2023-2025 Strand Coordinators

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Strand 2: Science Learning—Contexts, Characteristics and Interactions

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Strand 6: Science Learning in Informal Contexts

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Strand 7: Pre-service Science Teacher Education

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Strand 11: Cultural, Social, and Gender Issues

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Strand 13: History, Philosophy, Sociology, and Nature of Science

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Xinyu He	Shuochian Joe Shiu	Richard Lamb	Rahman Ashique
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Lúcia Helena Sasseron	Joseph Johnson	Elon Langbeheim	Aihan Maasen
Ben Herman	Devan Jones	Kim Lange-Schubert	Yetunde Mabadeje
Imogen Herrick	Eric Jones	Kathryn Lanouette	Nessrine Machaka
Cari Herrmann Abell	M. Gail Jones	Kaylee Laub	Anna MacPherson
Benedikt Heuckmann	Eugene Judson	James Laverty	Lauren Madden
Siti Hidayana Binti Nassiri	Yehudit Judy Dori	Michael Lawson	Seungho Maeng
Robbie Higdon	Min Jung Lee	Paul Le	Nicolette Maggiore
Priya Hinton	Gabriela Kaiana Ferreira	Anne Leak	Bridget Maher
Christine Hirst	Ugur Kale	Felicia Leammukda	Anina Mahmud
Bernhardt	Kostas Kampourakis	Soon Lee	Hamza Malik
Rebecca Hite	Hosun Kang	YewJin Lee	Lisa Marco-Bujosa
Noluthando Hlazo	Dilara Kara Zorluoglu	Pit Lepage	Letícia Marinho
		Amnon Levin	Mayra Marquez-Mendez

Program Proposal Reviewers

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Leah Master	Vivien Mweene	Suzanne Patzelt	Rebecca Rawson
Becky Mathers	Chabalengula	Alexander Paulchell	Jessica Reaves
Clausell Mathis	Shahriar Nafees	Chris Pavlovich	Carina Rebello
Daniel Matthew Levin	Chowdhury Raaz	Felix Pawlak	Michael Reiss
Alexis Mayfield	Slki Narae Lim	Melissa Pearcy	Danielle Rhemer
Carla McAuliffe	Josie Nardo	Marisa Peczuhs	Zuway R-Hong
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Sarah McDowell	Andreas Nehring	Hongyu Peng	Alexis Riley
Justin McFadden	Eva Nelson	Robyn Pennella	Devon Riter
Thomas McKenna	Alana Newell	Carlos Perez	Jonathan Rivera
Amber Meeks	UrLeaka Newsome	Veronica Pérez Serrano	Javier Robalino
Kim Megyesi-Brem	Ayşe Nihan Şatgeldi	Flores	Nicolas Robin
Insa Melle	Argyris Nipyrakis	David Perl-Nussbaum	de Robles
Ren Mendoza	Ryan Nixon	Asghar Pervaiz Gill	Shahaf Rocker Yoel
David Menendez	Felicia Nkrumah	Esther Peter	Marc Rodemer
Adjoa Mensah	Tara Nkrumah	Andrea Phillips	Hanna Røkenes
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Rhea Miles	Curtis O'Dwyer	Jacob Pleasants	Alexis Rutt
Jadda Miller	Yinka Ogunlade	Katarzyna Pomian	Maryam Saberi
Maizie Miller	John Ojeogwu	Bogdanov	Dana Sachayni
Anica Miller Rushing	Peter Okebukola	Sarah Poor	Nobomita Saha
Catherine Milne	Agyemang Okyere	Cheri Porter	Burak Sahin
James Minogue	Darko	Wardell Powell	Emine Sahin
Taya Misheva	Adekunle Oladejo	Rani Prasad	Demet Şahin Kalyon
Richie Moalosi	Daniel Oleynik	Adepeju Prince	Merav Saini
Olayinka Mohorn	Stacy Olitsky	Rajashri Priyadarshini	Toluwalase Salako
Robert Monahan	Deborah Oluwatosin	Muhammad Purwanto	Soykan Sandikcioglu
Austin Moore	Agbanimu	Senay Purzer	N. Sanjay Rebello
Sierra Morandi	Ray Opoku	Anjar Putro Utomo	Richard Sannert
Nancy Moreno	Rena Orofino	Asnat R. Zohar	Alejandra Santely
Maria Moreno Vera	Jonathan Osborne	Benjamin R. Lowell	Esra Sarıcı
Adi Moskovits	Peter Oyewole	Arif Rachmatullah	Sara Satanassi
Fatemeh Mozaffari	Ferah Özer	Jeffrey Radloff	Sean Savage
Ebru Muğaloğlu	Nilay OZTURK	Jennifer Radoff	Alyssa Sayavedra
Ali Muller	Elif Ozulku	Toma Radu Bogdan	George Schafer
Michelle Müller	Laura Pannullo	Natalie Rae	Anita Schuchardt
Bridget Mulvey	Priyanka Parekh	Jrène Rahm	Heather Schurman
Frackson Mumba	Jongchan Park	Kellyann Ramdath	Renee Schwartz
Danusa Munford	Soonhye Park	Kay Ramey	Meredith Schwendemann
	Wonyong Park	Miia Rannikmäe	

Program Proposal Reviewers

Martinique Sealy	Kristine Squillace	Maiza Trigo	Pirchi Waxman
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Quentin Sedlacek	Alex St. Louis	Graciela Trujillo	Matthew Weinstein
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Ozden Sengul	Sabrina Stanley	Kathy Trundle	Julianne Wenner
Daniel Serrano	Elizabeth Stansberry	Yu-Jan Tseng	Laura Wheeler
Keiphe Setlhatlhanyo	Gal Stern	Hsiao-Lin Tuan	Lindsay Wheeler
Elsun Seung	Lisa Stinken-Rösner	Grace Tukurah	Jeanna Wieselmann
Neta Shaby	Annabel Stoler	Heidi Turcotte	Hopegay Williams
Kazi Shahidullah	Tuba Stouthart	Refika Turgut	Michele Williams
Brian Shambare	Kate Strangfeld	Franklin U.	Sara Wilmes
Daniel Sharkey	Rachel Stronach	Onowugbeda	Matthew Wilsey
Manav Sharma	Shannon Stubbs	Bhaskar Upadhyay	Kerri Wingert
Meenakshi sharma	Henry Suárez	Annette Upmeier zu	Kevin Winn
Katherine Sharp	Karthigeyan	Belzen	Stephen Witzig
Or Shav-Artza	Subramaniam	Maya Usher	Nicole Wong
Carrie-Anne Sherwood	ChiJung Sui	Muhammad Usman Ijaz	Karen Woodruff
Yann Shiou Ong	Ryan Summers	Faezeh Vahdat Nia	Salome Wörner
Mary Short	Hye Sun You	Angie Valbuena Rojas	Ti'Era Worsley
Chuhui Si	Nivedha Sundar	Rachel van Aswegen	Jingyun Wu
Bernadette Sibuma	Rebecca Swanson	Malka van Dijk	Meng-Yang Wu
Tiffany-Rose Sikorski	Janari T	Helena van Vorst	Christine Wusylko
Elena Silverman	Tali Tal	Max Vazquez	Xin Xia
Jennifer Simons	Emily Tancredi-Brice	Dominguez	Ping Xiao
Michelle Sinapuelas	Agbenyega	Dana Vedder-Weiss	Yong Xie
Corinne Singleton	Arzu Tanisozcelik	Katherine Vela	Shiyu Xu
Anna Skorupa	Kristina Tank	Sotheara Veng	Mingfeng Xue
Dimitri Smirnoff	Dan Tao	Birgit Viru	Elad Yacobson
Bethany Smith	Yang Tao	Irit Vivante	Haoxuan Yang
Cody Smith	Giulia Tasquier	Tina Vo	Hui Yang
Julie Smith	Sebastian Tassoti	Andreas Vorholzer	Tingting Yang
Patrick Smith	Lezly Taylor	Rejoice Vorsah	Cathery Yeh
Rebecca Smith	Sureka Taylor	Katie Wade-Jaimes	Sevda Yerdelen Damar
Theila Smith	Gerald Tembrevilla	Aditi Wagh	Ella Yonai
Zacharoula Smyrnaiou	Başak Tepedelen	Lauren Wagner	SaeYeol Yoon
Danielle Sodani	Oliver Tepner	Steffen Wagner	Tugba Yuksel
Jorge Solis	Italo Testa	Noemi Waight	Anıl Yurdakul
Olutosin Solomon	Andrew Tetteh	Joi Walker	Jannis Zeller
Akinyemi	Sandhya Thakur	Jamie Wallace	Molly Zhang
Isaac Sonful	D Thom	Megan Walser	Yingzhi Zhang
Regina Soobard	Ashley Thomas	Crystal Wang	Jinzhí Zhou
Stefan Sorge	Preethi Titu	Jianlan Wang	Heather Zimmerman
Sherry Southerland	Ana-Maria Topliceanu	Lu Wang	Michal Zion
Ronja Sowinski	Hong Tran	Mengqian Wang	Lynne Zummo
Simge Söylemez	Khanh Tran	Song Wang	Melissa Zwick
Ornit Spektor-Levy	Trang Tran	Yangchunxiao Wang	
	Florian Trauten	Carol Waters	

NARST Presidents

1928 W. L. Eikenberry	1953 J. Darrell Barnard	1978 Roger G. Olstad	2002 Norman G. Lederman
1929 W. L. Eikenberry	1954 George G. Mallinson	1979 James R. Okey	2003 Cheryl L. Mason
1930 W. L. Eikenberry	1955 Kenneth E. Anderson	1980 John W. Renner	2004 Charles W. (Andy) Anderson
1931 Elliot R. Downing	1956 W. C. Van Deventer	1981 Stanley L. Helgeson	2005 John R. Staver
1932 Elliot R. Downing	1957 Waldo W. Blanchet	1982 Stanley L. Helgeson	2006 James A. Shymanksy
1933 Francis D. Curtis	1958 Nathan S. Washton	1983 Carl F. Berger	2007 Jonathan F. Osborne
1934 Ralph K. Watkins	1959 Thomas P. Fraser	1984 Ann C. Howe	2008 Penny J. Gilmer
1935 Archer W. Hurd	1960 Vaden W. Miles	1985 Ertle Thompson	2009 Charlene M. Czerniak
1936 Gerald S. Craig	1961 Clarence H. Boeck	1986 David P. Butts	2010 Richard A. Duschl
1937 Walter G. Whitman	1962 Herbert A. Smith	1987 James P. Barufaldi	2011 Dana L. Zeidler
1938 Honor A. Webb	1963 Ellsworth S. Obourn	1988 Linda DeTure	2012 J. Randy McGinnis
1939 John M. Mason	1964 Cyrus W. Barnes	1989 Patricia Blosser	2013 Sharon J. Lynch
1940 Otis W. Caldwell	1965 Frederic B. Dutton	1990 William G. Holliday	2014 Lynn A. Bryan
1941 Harry A. Carpenter	1966 Milton P. Pella	1991 Jane Butler Kahle	2015 Valarie L. Akerson
1942 G. P. Cahoon	1967 H. Craig Sipe	1992 Russell H. Yeany	2016 Mary M. Atwater
1943 Florence G. Billig	1968 John M. Mason	1993 Emmett L. Wright	2017 Mei-Hung Chiu
1944 Florence G. Billig	1969 Joseph D. Novak	1994 Kenneth G. Tobin	2018 Barbara Crawford
1945 Florence G. Billig	1970 Willard D. Jacobson	1995 Dorothy L. Gabel	2019 Gail Richmond
1946 C. L. Thield	1971 Paul D. Hurd	1996 Barry J. Fraser	2020 Tali Tal
1947 Earl R. Glenn	1972 Frank X. Sutman	1997 Thomas R. Koballa, Jr.	2021 Eileen R. C. Parsons
1948 Ira C. Davis	1973 J. David Lockard	1998 Audrey B. Champagne	2022 Renée Schwartz
1949 Joe Young West	1974 Wayne W. Welch	1999 Joseph S. Krajcik	2023 Gillian Roehrig
1950 N. Eldred Bingham	1975 Robert E. Yager	2000 David F. Treagust	2024 Jomo Mutegi
1951 Betty Lockwood	1976 Ronald D. Anderson	2001 Sandra K. Abell	2025 Jerome Shaw
1952 Betty Lockwood	1977 O. Roger Anderson		

NARST Executive Directors

(NARST created the position of Executive Secretary in 1975; the title was changed to Executive Director in 2003)

1975–1980 Paul Joslin	1990–1995 John Staver	2007–2017 Bill Kyle
1980–1985 Bill Holliday	1995–2000 Art White	2018–2021 Helen Schneider Lemay
1985–1990 Glenn Markle	2000–2002 David Haury	2021–2024 Lisa Martin-Hansen
	2002–2007 John Tillotson	2024–Present Mackenzie Kelley

JRST Editors

1963–1966 J. Stanley Marshall	1994–1999 William C. Kyle, Jr.	2011–2015 Joseph S. Krajcik
1966–1968 H. Craig Sipe	1999–2001 Charles W. (Andy) Anderson	Angela Calabrese Barton
1969 James T. Robinson	James J. Gallagher August	2016–2020 Fouad Abd-El-Khalick
1970–1974 O. Roger Anderson		Dana L. Zeidler
1975–1979 David P. Butts	2002–2005 Dale R. Baker	2021–2025 Felicia Moore Mensah
1980–1984 James A. Shymansky	Michael D. Piburn	Troy Dow Sadler
1985–1989 Russell H. Yeany, Jr.	2006–2010 J. Randy McGinnis	2026–2030 Matthew Kloser
1990–1993 Ronald G. Good	Angelo Collins	Edna Tan
		Dana Vedder-Weiss

Emeritus Members

Michael Agin	Larry Enochs	Glenn Markle	Donald Riechard
Hans Andersen	Elsa Feher	Robert Mayes	Ryda Rose
Charles Anderson	Allan Feldman	Mary McCarthy Hintz	Jo Ellen Roseman
Ronald Anderson	Patricia Friedrichsen	Alan McCormack	Kathryn Scantlebury
Carl Angell	Uri Ganiel	Charles McFadden	Donald Schmidt
Hanna Arzi	George Glasson	Gottfried Merzyn	Manuel Sequeira
Doris Ash	Richard Haney	Michael Michie	Robert Sherwood
Mary Atwater	David Haury	Jim Minstrell	James Shymansky
Dale Baker	Stanley Helgeson	Mansoor Niaz	Ellen Simmons
Nitza Barnea	Peter Hewson	Obed Norman	Doris Simonis
Marianne Barnes	Todd Hill	Albert Nous	Edward Smith
Guilford Bartlett	Avi Hofstein	Joseph Novak	Elke Sumfleth
John Bencze	Jack Holbrook	Peter Okebukola	Dennis Sunal
Glenn Berkheimer	William Holliday	Roger Olstad	J. Swift
Lowell Bethel	William Jaffarian	Jonathan Osborne	Marlene Thier
George Bodner	Joseph Jesunathadas	Ann Osman	Herbert Thier
Lynn Bryan	Paul Joslin	Isaac Otoo	Andree Tiberghien
Mei-Hung Chiu	Jane Kahle	Michael Padilla	Sue Tunnicliffe
John Christopher	David Kennedy	Sung Jae Pak	Ed Van Den Berg
Julia Clark	Aviva Klieger	Eileen Parsons	Richard Walding
Barbara Crawford	Gerald Krockover	Gian Pedemonte	Wayne Welch
David Crowther	William Kyle	Linda Phillips	Robert Williams
Helmut Dahncke	Judith Lederman	Michael Piburn	Mark Windschitl
George De Boer	Jay Lemke	Robert Poel	Larry Yore
Onno De Jong	Huann-shyang Lin	James Poth	Uri Zoller
Robert Dehaan	Ivo Lindauer	J. Prather	
Rodney Doran	Vincent Lunetta	Altaf Qadeer	
Dewey Dykstra	Jacqueline Mallinson	Leonie Rennie	



NARST Award Recipients

Distinguished Contributions to Science Education through Research Award

This award is presented at the Annual International Conference but is bestowed only when an outstanding candidate, or candidates, has been identified. It is given to recognize individuals who, through research over an extended period of time, have made outstanding and continuing contributions, provided notable leadership, and made a substantial impact in the area of science education.

Year	Awardee(s)
1986	Anton E. Lawson
1987	Paul DeHart Hurd
1988	John W. Renner
1989	Willard Jacobson
1990	Joseph D. Novak
1991	Robert L. Shrigley
1992	Pinchas Tamir
1993	Jack Easley, Jr.
1994	Marcia C. Linn
1995	Wayne W. Welch
1996	Carl F. Berger
1997	Rosalind Driver
1998	James J. Gallagher
1999	Peter J. Fensham
2000	Jane Butler Kahle
2001	John K. Gilbert
2002	Audrey B. Champagne
2003	Barry J. Fraser
2004	Robert E. Yager Paul Black
2005	John C. Clement
2006	David Treagust
2007	Kenneth Tobin
2008	Dorothy Gabel
2009	Peter W. Hewson Leonie Jean Rennie Wolff-Michael Roth
2010	Reinders Duit Joseph Krajcik
2011	Norman Lederman
2012	Charles W. (Andy) Anderson Larry Yore
2013	Dale R. Baker
2014	Glen Alkenhead Richard Gunstone Frances Lawrenz
2015	Richard A. Duschl Meshach Mobolaji Ogunniyi
2016	Lynn D. Dierking John N. Falk Dana L. Zeidler
2017	Avi Hofstein
2018	Marissa Rollnick Jonathan Osborne
2019	Mary M. Atwater Maria Pilar Jiménez-Aleixandre
2020	Judy Dori Saouma Bou Jaoude
2021	Valarie Akerson Greg Kelly
2022	Fouad Abd-El-Khalick Gail Jones
2023	Franz X. Bogner Okhee Lee
2024	Angela Calabrese Barton Julie Luft
2025	Sherry Southerland



NARST Award Recipients

Outstanding Doctoral Research Award (Sponsored by Wiley)

This award is given annually for the Doctoral Research judged to have the greatest significance in the field of science education from among all theses and dissertations nominated this year for the award.

Year	Awardee(s)	Advisor(s)
1992	Rene Stofflett	Dale R. Baker
1993	Julie Gess-Newsome	Norman G. Lederman
1994	Carolyn W. Keys	Burton E. Voss
1995	Jerome M. Shaw	Edward Haertel
1996	Christine M. Cunningham	William L. Carlsen
1997	Jane O. Larson	Ronald D. Anderson
1998	Kathleen Hogan	Bonnie K. Nastasi
1999	Fouad Abd-El-Khalick	Norman G. Lederman
2000	Danielle Joan Ford	Annemarie S. Palinscar
2001	Iris Tabak	Brian Reiser
2002	Mark Girod	David Wong
2003	Hsin-Kai Wu	Joseph Krajcik
2004	David L. Fortus	Ronald Marx Joseph Krajcik
2005	Thomas Tretter	Gail M. Jones
2006	Stacy Olitsky	Kenneth Tobin
2007	Julia Plummer	Joseph S. Krajcik
2008	Victor Sampson	Douglas Clark
2009	Lei Liu	Cindy E. Hmelo-Silver
2010	Heather Toomey	Phillip Bell Zimmerman

2011	Jeffrey J. Rozelle	Suzanne M. Wilson Kevin Crowley
2012	Melissa Braaten	Mark Windschitl
2013	Lori Fulton	Jian Wang
2014	Daniel Birmingham	Angela Calabrese Barton Anne-Lise Halvorsen
2015	Allison Godwin	Geoffrey Potvin
2016	Anna MacPherson	Jonathan Osborne
2017	Anita Schuchardt	Christian Schunn
2018	Katherine Wade-Jaimes	Renée Schwartz
2019	Anita S. Tseng	Jonathan F. Osborne
2020	Netta Shaby	Orit Ben Zvi-Assaraf
2021	Eben Witherspoon	Christian D. Schunn
2022	Won Jung Kim	Angela Calabrese Barton Alicia Alonzo
2023	Gary William Wright III	Cesar Delgado
2024	Grace P. Carroll K. "Ren" Rende Mendoza	Soonhye Park Carla Johnson
2025	Sam Lee Daniel R. Pimentel	Katherine L. McNeill Janet Carlson and Bryan Brown



NARST Award Recipients

Early Career Research Award

The Early Career Research Award is given annually to the early researcher who demonstrates the greatest potential to make outstanding and continuing contributions to research in science education. The recipient will have received his/her Doctoral degree within five years of receiving the award.

Year	Awardee(s)	2004	Grady J. Venville	2017	Ying-Chih Chen David Stroupe
1993	Wolff-Michael Roth	2005	Randy L. Bell	2018	Doug Lombardi
1994	Deborah J. Tippins	2006	Heidi Carbone	2019	Hosun Kang Eve Manz
1995	Nancy B. Songer	2007	Bryan A. Brown	2020	Brian Donovan Dana Vedder Weiss
1996	Mary B. Nakhleh	2008	Hsin-Kai Wu	2021	Lama Jaber
1997	Peter C. Taylor	2009	Troy D. Sadler	2022	Maria González-Howard Laura Zangori
1998	J. Randy McGinnis	2010	Thomas Tretter	2023	Natalie S. King Christina Krist
1999	Craig W. Bowen Gregory J. Kelly	2011	Katherine L. McNeill	2024	K.C. Busch Terrell R. Morton
2000	Angela Calabrese Barton	2012	Victor Sampson	2025	Marcus Kubsch
2001	Julie A. Bianchini	2013	Alandeom W. Oliveira		
2002	Alan G. Harrison	2014	Cory Forbes		
2003	Fouad Abd-El-Khalick	2015	Benjamin C. Herman		
		2016	Richard L. Lamb		

NARST Fellows Award

The NARST Fellow Program is an award program that honors and recognizes excellence in science education research and service. This program promotes and advances the NARST mission in science education, and the role of science education in the local and global community, by designating NARST members as Fellows.

Year	Awardee(s)	2023	Patricia Friedrichsen	2025	M. Gail Jones
2021	Bryan A. Brown	2024	Elizabeth Mavhunga	2025	Hosun Kang
2021	Richard A Duschl	2024	Carla Zembal-Saul	2025	Katherine L. McNeill
2021	Gillian Roehrig	2024	Renee' Schwartz	2025	Felicia Moore Mensah
2022	Peter A. Okebukola	2024	Christina Schwarz	2025	Eileen Parsons
2023	Julie Bianchini	2024	Lynn Bryan	2025	Bhaskar Upadhyay
2023	Ron Blonder	2025	Janet Carlson		

Excellence in Mentoring Award

Year	Awardee(s)
2024	Janet Carlson
2025	Ron Blonder

Future NARST Meeting Dates

2026 April 18 - 21 | Seattle, WA
2027 March 14 - 17 | Boston, MA



NARST Award Recipients

The *Journal of Research in Science Teaching (JRST)* Award

The JRST Award was awarded annually to the author or authors of the *Journal of Research in Science Teaching* article judged to be the most significant publication for the Volume year. It was awarded annually between 1974 and 2015.

Year	Awardee(s)	1990	Richard A. Duschl Emmett L. Wright	2006	Troy D. Sadler Dana L. Zeidler
1974	Donald E. Riechard Robert C. Olson	1991	E. P. Hart I. M. Robottom	2007	Jerome Pine Pamela Aschbacher Ellen Roth Melanie Jones Cameron McPhee Catherine Martin Scott Phelps Tara Kyle Brian Foley
1975	Mary Budd Rowe	1992	John R. Baird Peter J. Fensham Richard E. Gunstone Richard T. White		
1976	Marcia C. Linn Herbert C. Thier	1993	Nancy R. Romance Michael R. Vitale	2008	Christine Chin
1977	Anton E. Lawson Warren T. Wollman	1994	E. David Wong	2009	Kihyun Ryoo Bryan Brown
1978	Dorothy L. Gabel J. Dudley Herron	1995	Stephen P. Norris Linda M. Phillips	2010	Helen Patrick Panayota Mantzicopoulos Ala Samaratupungavan
1979	Janice K. Johnson Ann C. Howe	1996	David F. Jackson, Elizabeth C. Doster Lee Meadows Teresa Wood	2011	Daphne Minner Jeanne Century Abigail Jurist Levy
1980	John R. Staver* Dorothy L. Gabel* Linda R. DeTure	1997	C. W. J. M. Klassen P. L. Linjse	2012	Julie A. Luft Jonah B. Firestone Sissy S. Wong Irasema Ortega Krista Adams Eun Jin Bang
1981	William C. Kyle, Jr.	1998	Julie Bianchini		
1982	Robert G. Good* Harold J. Fletcher* F. David Boulanger	1999	Phillip M. Sadler		
1983	Jack A. Easley, Jr.	2000	Allan G. Harrison J. Grayson David F. Treagust		
1984	Marcia C. Linn Cathy Clement Stephen Pulos	2001	Fouad Abd-El-Khalick Norman G. Lederman	2013	Edys S. Quellmalz Michael J. Timms Matt D. Silbergliitt Barbara C. Buckley
1985	Julie P. Sanford	2002	Andrew Gibert Randy Yerrick		
1986	Anton E. Lawson	2003	Sofia Kesidou Jo Ellen Roseman		
1987	Russell H. Yeany Kueh Chin Yap Michael J. Padilla	2004	Jonathan Osborne Sue Collins Mary Ratcliffe Robin Millar Richard Duschl	2014	Joseph Taylor Susan Kowalski Christopher Wilson Stephen Getty Janet Carlson
1988	Kenneth G. Tobin James J. Gallagher	2005	Jonathan Osborne Sibel Erduran Shirley Simon	2015	Matthew Kloser
1988	Robert D. Sherwood* Charles K. Kinzer* John D. Bransford* Jeffrey J. Franks* Anton E. Lawson*				
1989	Glen S. Aikenhead				

*Tie



NARST Award Recipients

The NARST Outstanding Paper Award

The NARST Outstanding Paper Award was awarded annually for the paper or research report presented at the NARST Annual International Conference that was judged to have the greatest significance and potential in the field of science education. It was awarded annually between 1975 and 2015.

Year	Awardee(s)	1989	James J. Gallagher Armando Contreras	2004	Joanne K. Olson* Sharon J. Lynch*
1975	John J. Koran	1990	Patricia L. Hauslein Ronald G. Good Catherine Cummins		Joel Kuipers Curtis Pyke Michael Szesze
1976	Anton E. Lawson	1991	Nancy R. Romance Michael Vitale	2005	Chi-Yan Tsui David Treagust
1977	NO AWARD	1992	Patricia Heller Ronald Keith Scott Anderson	2006	Leema Kuhn Brian Reiser
1978	Rita Peterson	1993	Wolff-Michael Roth	2007	Eugene L. Chiappetta Tirupalavanam G. Ganesh Young H. Lee Marianne C. Phillips
1979	Linda R. DeTure	1994	Wolff-Michael Roth Michael Bowen	2008	Guy Ashkenazi Lana Tockus-Rappoport
1980	M. James Kozlow Arthur L. White	1995	Wolff-Michael Roth	2009	Jrene Rahm
1981	William Capie Kenneth G. Tobin Margaret Boswell	1996	Nancy J. Allen	2010	Mark W. Winslow John R. Staver Lawrence C. Sharman
1982	F. Gerald Dillashaw James R. Okey	1997	NO AWARD	2011	Matthew Kloser
1983	William C. Kyle, Jr. James A. Shymansky Jennifer Alport	1998	Wolff-Michael Roth Reinders Duit Michael Komorek Jens Wilbers	2012	Shelly R. Rodriguez Julie Gess-Newsome
1984	Darrell L. Fisher Barry J. Fraser	1999	Lynn A. Bryan	2013	Edward G. Lyon
1985	Hanna J. Arzi* Ruth Ben-Zvi* Uri Ganiel* Russell H. Yeany Kueh Chin Yap Michael J. Padilla	2000	Joseph L. Hoffman Joseph S. Krajcik	2014	Ying-Chih Chen Soonhye Park Brian Hand
1986	Barry J. Fraser* Herbert J. Walberg* Wayne W. Welch*	2001	Allan G. Harrison	2015	Lori M. Ihrig Michael P. Clough Joanne K. Olson
1987	Robert D. Sherwood	2002	Carolyn Wallace Keys Eun-Mi Yang Brian Hand Liesl Hohenshell		
1988	Barry J. Fraser Kenneth G. Tobin	2003	Wolff-Michael Roth		

*Tie



NARST Award Recipients

Outstanding Masters Thesis Award

This award was established in 1995 to be given annually for the Master's Thesis judged to have the greatest significance in the field of science education. It was last awarded in 2002.

Year	Awardee	Major Professor	Advisor
1995	Moreen K. Travis	Carol L. Stuessy	
1996	Lawrence T. Escalada	Dean A. Zollman	
1997	C. Theresa Forsythe	Jeffrey W. Bloom	
1998	Renee D. Boyce		Glenn Clark
1999	Andrew Gilbert		Randy K. Yerrick
2000	Rola Fouad Khishfe		Fouad Abd-El-Khalick
2002	Laura Elizabeth Slocum		Marcy Hamby Towns

Classroom Applications Award

The Classroom Applications Award was established in 1979. The award was given annually to authors whose papers were presented at the previous NARST Annual International Conference and judged to be outstanding in terms of emphasizing classroom application of research in science education. The award was last presented in 1991.

Year	Awardee(s)			
1980 <i>Five Equal Awards</i>	Livingston S. Schneider	1982	Louise L. Gann	1986
	John W. Renner	<i>Four Equal Awards</i>	Seymour Fowler	Sarah Chandran
	Heidi Kass		Dorothy L. Gabel	David F. Treagust
	Allan Griffiths		Robert D. Sherwood	Kenneth G. Tobin
	Ramona Saunders	1983	Thomas L. Russell	
	Russell H. Yeany		Joseph C. Cotham	Darrell L. Fisher
	Joe Long		Robert D. Sherwood	Barry J. Fraser
1981 <i>Four Equal Awards</i>	James R. Okey		Larry G. Enochs	Dorothy L. Gabel
	Russell H. Yeany		Dorothy L. Gabel	Stanley L. Helgeson
	M. James Kozlow	1984	Mary Westerback	Joseph D. Novak
	Arthur L. White	<i>Three Equal Awards</i>	Clemencia Gonzales	John Butzow
	Dorothy L. Gabel		Louis H. Primavera	V. K. Samuel
	Robert D. Sherwood		Kenneth G. Tobin	Linda Cronin
	Larry G. Enochs		Hanna J. Arzi	Meghan Tweist
1985 <i>Three Equal Awards</i>	Wayne Welch		Ruth Ben-Zvi	Michael J. Padilla
	Ronald D. Anderson		Uri Ganiel	Dorothy L. Gabel
	Harold Pratt		Charles Porter	V. K. Samuel
	Mary Ellen Quinn	1988	Russell H. Yeany	Stanley L. Helgeson
	Carolyn Kessler		Dan L. McKenzie	Saundra McGuire
	P. Ann Miller		Michael J. Padilla	Joseph D. Novak
	Russell H. Yeany		Margaret Walkosz	John Butzow
1989	Kevin C. Wise	1989	Russell H. Yeany	Uri Zoller
	James R. Okey			Ben Chaim
	Dale R. Baker	1990		James D. Ellis
	Michael D. Piburn			Paul J. Kuerbis
	Dale S. Niederhauser			Dale R. Baker
	David F. Jackson	1991		Michael D. Piburn
	Billie Jean Edwards			Dale S. Niederhauser
	Carl F. Berger			David F. Jackson

NARST Standing Committees

Awards Committee	
Final Year	Board Liaison
2025	Amelia Wenk Gotwals Michigan State University
Outstanding Doctoral Research Award	
Final Year	Committee Leadership
2025	David C. Owens (Chair) University of Montana
2026	Dina Tsybulsky (Co-Chair) Technion, Israel
Members	
2025	Eunjin Bahng Iowa State University
2025	Maia Elkana Washington University in St. Louis
2025	Guopeng Fu East China Normal University
2025	Nilay Ozturk Kirsehir Ahi Evran University, Turkey
2026	Mindy Chappell Portland State University
2026	Colby Tofel-Grehl Utah State University
2026	Annabel Stoler Boston University
2026	David Stroupe Michigan State University
2026	Noemi Waight University at Buffalo
2026	Stephanie Batres Spezza University of Illinois - Chicago
2027	Mary Short George Washington University
2027	Julianne Wenner Clemson University

Early Career Research Award	
Final Year	Committee Leadership
2025	Bridget Miller (Chair) University of South Carolina
Members	
2025	Eleanor Abrahms University of Massachusetts Lowell
2025	Ben Herman Texas A&M University
2026	Katherine Doerr Mount Aloysius College
2026	Katherine Doerr Malmo University, Sweden
2026	Uchenna Emenaha The University of Texas at San Antonio
2026	Laura Zangori University of Missouri
2027	Meg Blanchard North Carolina State University
2027	Hyesun You University of Iowa
2027	Gary William Wright University of Missouri
2027	Elizabeth (Betsy) Davis University of Michigan

NARST Standing Committees

NARST Standing Committees

Awards Committee (cont.)	
Distinguished Contributions to Science Education Through Research	
Final Year	Committee Leadership
2025	Mei-Hung Chiu (Chair) National Taiwan University
2026	Saouma BouJaoude (Co-Chair) American University of Beirut, Lebanon
Members	
2025	Justin Dillon Exeter University, UK
2025	Kathy Trundle Utah State University
2026	Carla Johnson NC State University
2026	Gail Jones NC State University
2027	Okhee Lee New York University
2027	Fouad Abd-El-Khalick University of North Carolina-Chapel Hill
2027	Greg Kelly Pennsylvania State University
NARST Fellow Award	
Final Year	Committee Leadership
2025	Enrique (Henry) Suarez (Chair) University of Massachusetts, Amherst
2025	Lezly Taylor (Co-Chair) Virginia Polytechnic Institute and State University
Members	
2026	Helena Aptyka University of Cologne, Germany
2026	Flavia Kigozi University of Witwatersrand, South Africa
2026	Laura B. Schneider St. Mary's College of Maryland, OpenSciEd
2027	Ron E. Gray Northern Arizona University
2027	Peter Okebukola Lagos State University

Elections Committee	
Final Year	Committee Leadership
2026	Nazan U. Bautista (Chair) Miami University
2027	Muhammad Abd Hadi Bunyamin (Incoming Chair) Universiti Teknologi Malaysia
2025	David Crowther (Outgoing Chair) University of Nevada, Reno
Members	
2025	Holly Kennedy Amerman University of Georgia
2025	Carina Rebello Purdue University-Main Campus
2026	Angela Chapman University of Texas Rio Grande Valley
2026	Susie M. Cohen Trinity International University
2026	Tim Klavon Black Hills State University
Board Member Liaison	
2027	Heba EL-Deghaidy American University in Cairo

NARST Standing Committees

NARST Standing Committees

Equity and Ethics Committee

Final Year	Committee Leadership
2026	Regina McCurdy (Chair) Georgia Southern University
2025	Justice T. Walker (Outgoing Chair) University of Texas at El Paso
2027	Illiana Esther De La Cruz (Incoming Chair) Texas A&M University
Members	
2025	Marsha E Simon University of West Georgia
2026	Laura Peña-Telfer Georgia State University
2027	Devasmita (Deva) Chakraverty Indian Institute of Management Ahmedabad
2027	Dominick Fantacone SUNY Cortland Director of Research and Sponsored Programs
2027	Maria R. Maulucci Barnard College
2027	Khanh Q. Tran Purdue University
Board Member Liaison	
2025	Sharon Nelson-Barber WestEd

External Policy and Relations Committee

Final Year	Committee Leadership
2025	Ellen Granger (Chair) Florida State University
2026	Mark Meszaros (Co-Chair) Carolina Biological Supply Company
Members	
2026	Christina Baze The University of Texas at Austin
2026	Allison Esparza Texas A&M University

External Policy and Relations Committee (cont.)

2026	Brittany Gavrin Hudson University of Mary Washington
2027	Julie Bianchini University of California, Santa Barbara
2027	Zoubeida R. Dagher University of Delaware
Board Liaison	
2027	Kristin Gunckel University of Arizona

Membership Committee

Final Year	Committee Leadership
2025	Melanie Kinskey (Chair) Texas A&M University
2026	Joi Merritt (Co-Chair) James Madison University
Members	
2025	Harini Krishnan University of Utah
2025	Mihwa Park Texas Tech University
2025	Harleen Singh University of Georgia
2026	Jonathan Bowers Michigan State University
2026	Alyssa Freeman Middle Tennessee State University
2026	Grant Gardner Middle Tennessee State University
2027	Ilayda Kilic Kocaeli University, Turkey
2027	Theila Smith Brooklyn College
Board Liaison	
2026	S. Selcen Guzey Purdue University

NARST Standing Committees

Graduate Student Committee

The Graduate Student Committee is composed of graduate student members appointed by the President-elect. The committee is chaired by the Graduate Student Representative, a non-voting (ex-officio) liaison to the NARST Board. A Board Director is appointed to serve as an ex officio advisor to the committee.

Final Year	Graduate Student Coordinator
2025	Jennifer Bateman (Chair) University of Georgia
Committee Leadership	
2025	Savannah Hayes (Co-Chair) Space Center Houston
2026	Alexander Eden (Co-Chair) Florida International University
Members	
2025	Deborah Cotta Universidad Federal de Minas Gerais, Brasil
2025	Beyza Okan Bogazici University
2025	Amy Padolf Florida International University
2025	Mutiara Syifa Illinois State University
2025	Johan Tabora Northwestern University
2026	Brandin Conrath Virginia Commonwealth University
2026	Austin R. Jenkins Purdue University
2026	Muhammad Guntur Purwanto (Guntur) University of Minnesota
2026	Andrea Reeder Middle Tennessee State University
2026	Kristal Louise Turner University of Calgary, Canada
2026	Lauren E. Wagner University of North Alabama

International Committee

Final Year	International Coordinator
2025	Mercy Ogunsola-Bandele (Chair) National Open University of Nigeria
Committee Leadership	
2025	Ranu Roy (Co-Chair) Amity University Kolkata, India
2026	Arif Rachmatullah (Co-Chair) SRI International
Members	
2025	Nuri Balta Suleyman Demirel University
2025	Aerin W. Benavides University of North Carolina Greensboro
2025	Imran Tufail University of Waikato
2026	Estelle Blanquet University of Bordeaux - France
2026	Christelle Fayad Texas Christian University
2026	Jose Pavez University of Georgia
2027	Sahar Alameh University of Kentucky
2027	Shirly Avargil Technion Junior Faculty, Israel
2027	Keren Dalyot Weizmann Institute of Science, Israel
2027	Argyris Nipyrakis University of Chicago
2027	Giulia Tasquier University of Bologna, Italy

NARST Standing Committees

NARST Standing Committees

Program Committee	
Final Year	Committee Leadership
2025	Jerome Shaw (Chair) University of California, Santa Cruz
2026	Jennifer D. Adams (Co-Chair) University of Calgary, Canada
Members	
2025	Quentin Biddy University of Colorado, Boulder
2025	Narendra Dadarao Deshmukh Homi Bhabha Centre for Science Education
2025	Daniela Fiedler University of Copenhagen
2025	Peng He Michigan State University
2025	Sophia Jeong University of Georgia
2025	Anne Emerson Leak High Point University
2025	Jing Lin Beijing Normal University
2025	Allison Antink-Meyer Illinois State University
2025	Jamie N. Mikeska ETS
2025	Emily Adah Miller University of Georgia
2025	Tara Nkrumah Arizona State University
2025	Rebecca Swanson University of Nebraska-Lincoln
2025	Preethi Titu Kennesaw State University
2025	Yang Yang Qingdao University

2026	Rouhollah Aghasaleh California State Polytechnic University, Humboldt
2026	Rachel van Aswegen University of Virginia
2026	Selina Lynn Bartels Valparaiso University
2026	Julie C. Brown University of Florida
2026	Sanlyn Buxner University of Arizona
2026	Mila Rosa Librea Carden University of North Texas
2026	Robbie. L. Higdon James Madison University
2026	TingTing Li Michigan State University
2026	Stefanie L. Marshall Michigan State University
2026	Kelli Paul Indiana University
2026	Anita Schuchardt University of Minnesota
2026	Quentin Sedlacek Southern Methodist University
2026	Jill Wertheim WestEd
2026	Moyu (Molly) Zhang New York University

NARST Standing Committees

NARST Standing Committees

Publications Advisory Committee	
	Committee Leadership
2025	Tina Vo (Chair) University of Nevada, Las Vegas
2027	Marcus Kubsch (Co-Chair) Freie University-Berlin
Members	
2025	Cesar Delgado North Carolina State University
2025	Li Ke University of North Carolina Chapel Hill
2025	Linda Morell UC Berkeley
2026	Eli Tucker-Raymond Boston University
2027	Justin McFadden University of Louisville
2027	Melissa Mendenhall Utah State Board of Education
2027	James Minogue North Carolina State University
2027	Samuel Severance Northern Arizona University
2027	Sissy Wong University of Houston
2027	Yewon Lee University of Maryland at College Park
2027	Danielle Malone Purdue University
Board Liaison	
2026	Shiang-Yao Liu National Taiwan Normal University

Research Committee	
Final Year	Committee Leadership
2026	Bryan H. Nichols (Chair) Florida Atlantic University
2027	Colby Tofel-Grehl Utah State University
Members	
2025	Liam Guilfoyle University of Oxford
2025	James Nyachwaya North Dakota State University
2025	Mina Sedaghatjou Rowan University
2025	Karen Woodruff Kean University
2025	Ezgi Yesilyurt Weber State University
2026	Alexander Bohn Northern Virginia Community College
2026	Saramma Chandy Mumbai University
2026	Michael Giamellaro Oregon State University
2026	Carrie-Anne Sherwood Southern Connecticut State University
2027	Franz X. Bogner University of Bayreuth (Germany)
2027	Beth A. Covitt University of Montana
2027	Dr. Patrice Juliet Pinder Independent STEM Education Researcher
2028	Stephen B. Witzig University of Massachusetts Dartmouth
Board Liaison	
2027	Meredith Park Rogers Indiana University

NARST Standing Committees

Social Media, Website and Communications Committee	
Final Year	Committee Leadership
2026	Gary Weiser (Chair) Bill and Melinda Gates Foundation
2025	Ryan Cain (Outgoing Chair) Weber State University
2027	Stephanie Teeter (Co-Chair) North Carolina State University
Members	
2025	Anna Maria Arias Kennesaw State University
2025	Stanton Belford University of Tennessee Southern
2025	Won Jung Kim Santa Clara University

2026	Linsey Brennan Michigan State University
2026	Marti Canipe Northern Arizona University
2026	Suzanne Poole Patzelt Touro University
2027	Katerina Pia Gunter San Francisco State University
2027	Olayinka Mohorn University of Memphis
2027	Christina Schwarz Michigan State University
Board Liaison	
2026	Patrick Enderle Georgia State University



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What is science?
Nature of Science
Idealized Science
Inquiry
Practice



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Expected Teacher Effort (X-axis)

- Science Conference at High School
- Long-term Projects
- Studio-in-a-Box
- View-and-do Instructor Videos
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- Quick Quizzes
- Idealized Science Podcast
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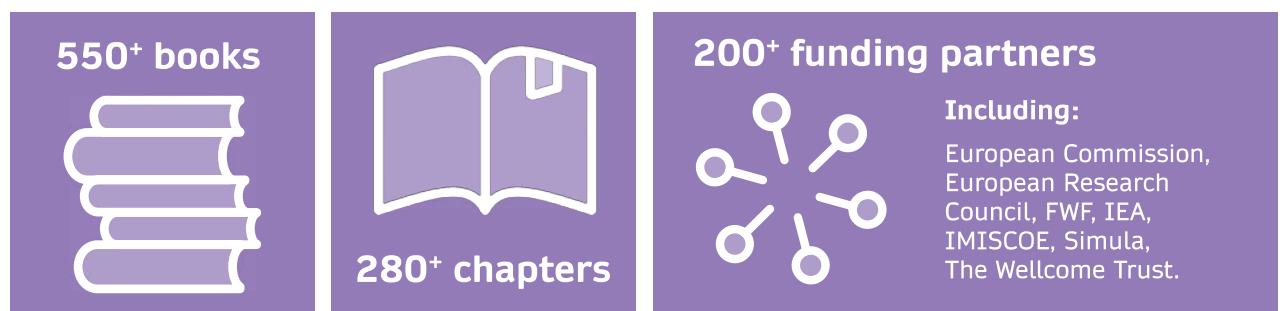
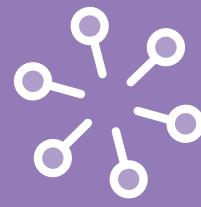
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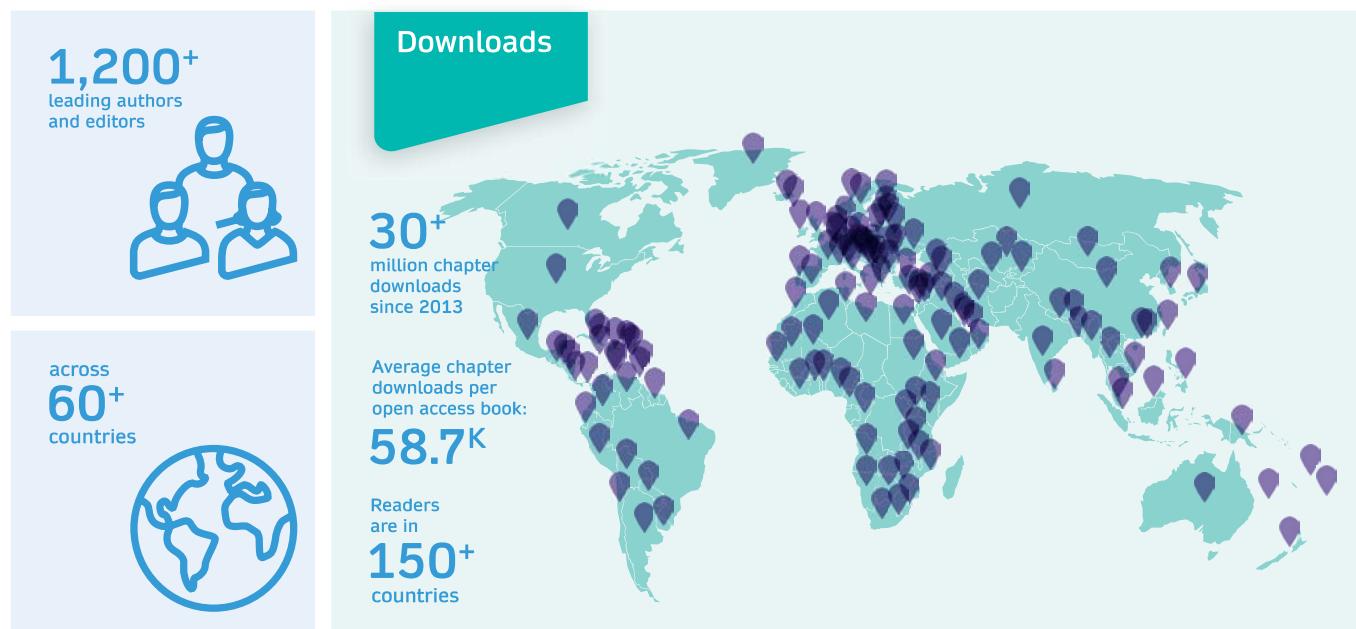
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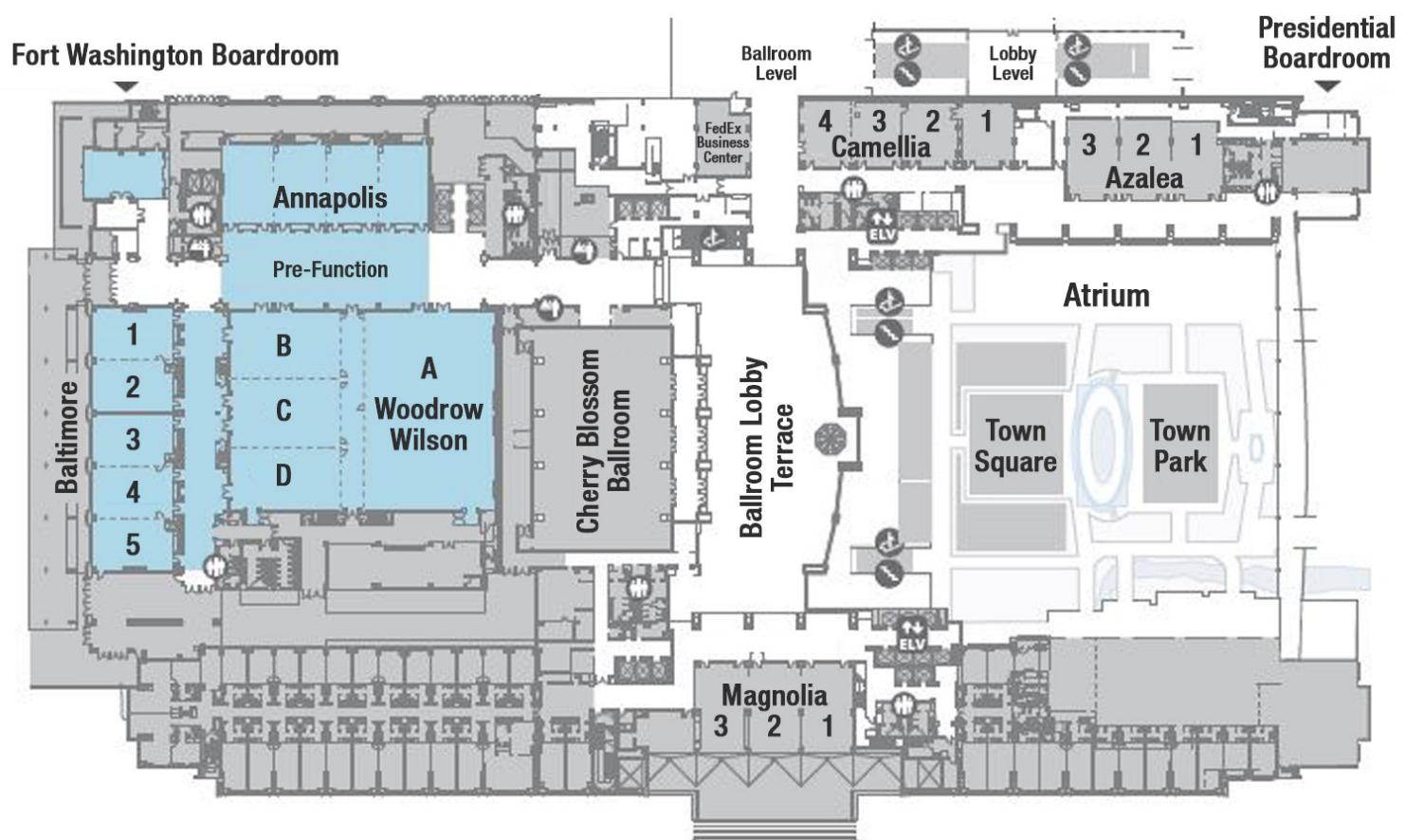
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Contact Claudia Acuna
Editor, Science Education



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GAYLORD HOTEL MAP



NARST 2026 Conference Theme

Prepared by Jennifer D. Adams, NARST President-Elect

Joyful Transgressions and Radical Imagination in Science Education

“The classroom, with all its limitations, remains a location of possibility. In that field of possibility, we have the opportunity to labor for freedom to demand of ourselves and our comrades an openness of mind and heart that allows us to face reality even as we collectively imagine ways to move beyond boundaries, to transgress.”

- Bell Hooks

What could science teaching, learning and research look like in our wildest dreams? What could science teachers, learners, communities, and researchers be saying, thinking, doing, and feeling? What could be the priorities of science education?

Urgent times calls for radical actions and opportunities to collectively imagine different worlds and plot futures where we all can flourish. Uncertainty and global transitions create openings for radical world-building—moving beyond what is given, including the imaginations imposed by those in power. Could we dare to envision a world where everyone can thrive, where the flourishing of all humans and more-than-humans is the status quo? As such, it is imperative that we locate and create spaces of hope, imagination, and joy in science education—spaces where we re-envision how we can live well together on this pale blue dot that we call home.

The NARST 2026 Annual Meeting invites us to collectively imagine and build a world where scientific knowledge making is connected to lived experience and recorded through, as Sylvia Wynter suggests, “representational and biological feelings,” and the creation of spaces where “there is unlimited access to the pleasure and power of knowing,” as Bell Hooks advocates. This challenges us to re-engage with the fully human aspects of science learning

considering some of the following provocations: What would happen if we considered play in science learning across contexts and lifespan? What joyful methodologies could we employ to research science learning? How could we enact care alongside students, teachers, communities, and peers in our work? What would happen if we started our projects from a place of trust and relationship-building? Given that NARST's ultimate goal is to help all learners achieve science literacy, how might we reimagine science literacy with social, environmental, and epistemological justice at its core?

This conference theme invites us to share the ways that we can transgress canonical boundaries in science education and expand dialogues on strategies for disrupting structures that sustain inequities, and in the spirit of Bell Hooks, “[envision] new, alternative, oppositional aesthetic acts that both challenge and transcend [given] frameworks and limitations.”

This conference is a step toward forging deeper connections between science and social life across formal, informal, and lived contexts—unpacking histories, reimagining relationships with science, and ultimately working toward a scientific endeavor of joyful transgressions and world-building. Together, we will envision and enact future-oriented approaches that cultivate a radical reimagining of what science education—and the world—can be.



NARST

A global organization for improving
science education through research

99th NARST International Conference

Seattle | April 19-22, 2026

Joyful Transgressions and Radical Imagination in Science Education



Virtual Conference Day

13 March 2025

Opening and Welcome

13-Mar-25, 9:30 AM-10:00 AM

Location: Zoom A

Presidential Welcome

Multi-Strand Stand-Alone Paper Set 1

Strand 2: Science Learning: Contexts, Characteristics and Interactions

13-Mar-25, 10:00 AM-11:30 AM

Location: Zoom A

Stand-Alone Paper

Research on social regulation learning in collaborative socioscientific issues argumentation

Yong Xie*, Beijing Normal University, China

Yangchunxiao Wang, Beijing Normal University, China

Xingda Li*, Beijing Normal University, China

Shuhao Yang*, Beijing Normal University, China

Yonghe Zheng*, Beijing Normal University, China

Stand-Alone Paper

Supporting the Development of Scientific Arguments about Ecosystems Responses to Disturbances

Kaya Easley*, Northern Illinois University, USA

Steven McGee*, The Learning Partnership, USA

M. Britt, Northern Illinois University, USA

Amanda Durik, Northern Illinois University, USA

Randi McGee-Tekula, The Learning Partnership, USA

Stand-Alone Paper

Exploring Metaphorical Differences and Language Switching in Multilingual Students'

Translanguaging: A Study on Heat Transfer

Rajashri Priyadarshini*, Indian Institute of Technology Bombay, India

Chandan Dasgupta, University of Twente, Netherlands

Sahana Murthy, Indian Institute of Technology Bombay, India

Stand-Alone Paper

Enhancing students' achievement in software development cycle through a cultural, technological and contextual pedagogy

Henry Okorie*, Africa Centre of Excellence for Innovative and Transformative STEM Education, Lagos State University, Nigeria

Uchenna Ugwuoke*, Africa Centre of Excellence for Innovative and Transformative STEM Education, Lagos State University, Nigeria

Peter Okebukola, Africa Centre of Excellence for Innovative and Transformative STEM Education, Lagos State University, Nigeria

Rasheed Sanni, Africa Centre of Excellence for Innovative and Transformative STEM Education, Lagos State University, Nigeria

Abdurrazaq Olawale, Africa Centre of Excellence for Innovative and Transformative STEM Education, Lagos State University, Nigeria

Stand-Alone Paper

Efficacy of Learning Management Systems in Cybersecurity Education in an ODeL Environment in Ghana

Felicia Nkrumah*, Lagos State University, Nigeria

Peter Okebukola, Lagos State University, Nigeria

Oluwatoyin Enikuomehin, Lagos State University, Nigeria

Emmanuel Ekwam, Lagos State University, Nigeria

Adekunle Oladejo, Lagos State University, Nigeria

Stand-Alone Paper

Middle school students' climate literacy and climate change awareness: Validation of two instruments

Nilay Ozturk*, Bahcesehir University, Turkey

Osman Aksit, Bogazici University, Turkey

Nazmiye Ertugrul, Bogazici University, Turkey

Ayse Gul Celenk, Bahcesehir University, Turkey

Naz Fulya Cibik, Mugla Sitki Kocman University, Turkey

Zeynep Aydin, Bogazici University, Turkey

Yasemin Ozdem-Yilmaz, Mugla Sitki Kocman University, Turkey

Gaye Ceyhan, Bogazici University, Turkey

Multi-Strand Stand-Alone Paper Set 2

Strand 11: Cultural, Social, and Gender Issues

13-Mar-25, 10:00 AM-11:30 AM

Location: Zoom B

Stand-Alone Paper

Collaborative Creation of Culture-Infused Chemistry Card Game for an Under-resourced College Students

Hai Vo*, University of Science, Vietnam

Le Duong*, University of Science, Vietnam

Trinh Nguyen*, University of Science, Vietnam

Anh Mai Nguyen, University of Science, Vietnam

Thuy Nguyen, University of Science, Vietnam

Hanh Dinh, Vermont State University, USA

Stand-Alone Paper

Colonial influence in shaping the science education discourse in Bangladesh

Shamnaz Arifin Mim*, McGill University, Canada

Stand-Alone Paper

Exploring the Challenges of Implementing Experiential Learning in the Secondary Level Science Curriculum: Teachers Perspective

Anika Arpa*, University of Dhaka, Bangladesh

Umme Tithi, University of Dhaka, Bangladesh

MD Baktiar Bulbul, University of Dhaka, Bangladesh

Stand-Alone Paper

Physics Teaching using technology at secondary level: A TPACK perspectives of teachers views and practice

MD Baktiar Bulbul*, University of Dhaka, Bangladesh

S M Rahman, University of Dhaka, Bangladesh

Anika Arpa, University of Dhaka, Bangladesh

Md Shahadat Khan, Islamic University of Technology, Bangladesh

Shariar Nafees Raaz, University of Dhaka, Bangladesh

Mehedi Anik, University of Dhaka, Bangladesh

Stand-Alone Paper

Harnessing the Power of Culturo-Techno-Contextual Approach plus to Transform Students' Perspectives on Food, Nutrition, Metabolism

Agyemang Okyere Darko*, Lagos State University, Nigeria

Peter Okebukola, Lagos State University, Nigeria

Franklin Onowugbeda, Lagos State University, Nigeria

Stand-Alone Paper

Secondary Level Physics Teachers' Collaborative Practices and Challenges to Promote Scientific Literacy

Shahriar Nafees Chowdhury Raaz, University of Dhaka, Bangladesh

S M Hafizur Rahman*, University of Dhaka, Bangladesh

Mehedi Hasan Anik, Côte de Azur University, France

Md Baktiar Alam Bulbul, Green University of Bangladesh, Bangladesh

Interrogating Context in the Study of Affect and Emotion for Dignity and Justice

Strand 11: Cultural, Social, and Gender Issues

13-Mar-25, 10:00 AM-11:30 AM

Location: Zoom C

Related Paper Set

Pedagogies of Joy ;)

D Keifert*, University of North Texas, USA

Day Greenberg*, Indiana University, USA

Déana Scipio*, IslandWood, USA

Sarah Lee, University of Washington, USA

Related Paper Set

Exposing and Challenging "Grit" in Physics Education

Amy Robertson*, Seattle Pacific University, USA

Verónica Vélez, Western Washington University, USA

Trà Huynh, Western Washington University, USA

W. Hairston, Equitable Development LLC, USA

Related Paper Set

Raciolinguistic Hierarchies of Feeling in U.S. Science Education

Kathryn Kirchgassler*, University of Wisconsin-Madison, USA

Related Paper Set

'Everyone's Struggling:' Coping with Institutionalized Hierarchies of Competence Through Emotional Resonance

Muxin Zhang*, University of Illinois Urbana-Champaign, USA

Eric Kuo, University of Illinois Urbana-Champaign, USA

Related Paper Set

Affective Contradictions in Future-Oriented Science and Sustainability Education

Hanna Røkenes*, University of Oslo, Norway

Alfredo Jornet Gil*, University of Girona, Spain

Roundtable Discussions

13-Mar-25, 12:00 PM-1:30 PM

Location: Zoom A

Strand 14: Environmental Education and Sustainability

WIP Roundtable

Examining Ontarios Pre- and In-service Elementary Teachers Knowledge and Beliefs about Climate Change

Shiva Javanmardi*, The University of Western Ontario, Canada

Anton Puvirajah, The University of Western Ontario, Canada

Strand 10: Curriculum and Assessment

WIP Roundtable

From written to enacted curriculum: what topics do elementary teachers choose to teach and why?

Mariana Luzuriaga*, Universidad de San Andres, Argentina

Agustina Ollivier, Universidad de San Andres, Argentina

Melina Furman, Universidad de San Andres, Argentina

Strand 11: Cultural, Social, and Gender Issues

WIP Roundtable

A Systematic Review of Translanguaging Practices in K-12 Science Education

Zixin Zeng*, The University of Hong Kong, China

Strand 7: Pre-service Science Teacher Education

Roundtable

Utilizing Phenomenon-based Science Instruction to Enhance Preservice Teachers' Skills in Generating Hypothetico-Predictive Reasoning

Noushin Nouri*, University of Texas Rio Grande Valley, USA

Leslie Garrido, University of Texas Rio Grande Valley, USA

Saberi Maryam, Ministry of Education, Iran, Islamic Republic of

Morteza Karimi Aghbolagh, University of Texas Rio Grande Valley, USA

Strand 13: History, Philosophy, Sociology, and Nature of Science

Roundtable

Bridging the Gap: How Designed Purposes Facilitate Authentic Scientific Purposes in Citizen Science Project

Haya Ben Simon*, Technion, Israel

Dina Tsybulsky, Technion, Israel

Strand 15: Policy, Reform, and Program Evaluation

WIP Roundtable

Implementing New Science Course Pathways in Urban High School District

Claudia Castillo-Lavergne*, Rutgers University, USA

Meril Antony, Rutgers University, USA

Vandeeen Campbell, Rutgers University,
USA

Strand 3: Science Teaching — Primary School (Grades preK-6): Characteristics and Strategies

WIP Roundtable

Unpacking Teacher Understanding of the Next Generation Science Standards through a Vignette

Min Jung Lee*, University of North Dakota, USA

Martha Inouye, University of Wyoming, USA

Meghan Macias, Wested, USA

Tugba Boz, Purdue University, USA

Strand 4: Science Teaching — Middle and High School (Grades 5-12): Characteristics and Strategies

Roundtable

Science Teachers' learning from what matters students for transformative practice: A Change Laboratory study

Isaac Coffie*, University of Technology Sydney, Australia

Virtual Poster Session

13-Mar-25, 12:00 PM-1:30 PM

Location: Zoom B

Strand 3: Science Teaching — Primary School (Grades preK-6): Characteristics and Strategies

Poster

A Bibliometric and Content Analysis of Research in Elementary Science Education

Shuhao Yang*, Beijing normal university, China

Yang Tao, Beijing normal university, China

Dan Tao, Beijing normal university, China

Strand 3: Science Teaching — Primary School (Grades preK-6): Characteristics and Strategies

Poster

An Exploratory Study Assessing the Instructional Quality of Preservice Teachers' Engineering Tasks

Danielle Rhemer*, Old Dominion University, USA

Keri Parker*, Old Dominion University, USA

Samantha Myers, Old Dominion University, USA

Kristie Gutierrez, Old Dominion University, USA

Jennifer Kidd, Old Dominion University, USA

Strand 12: Technology for Teaching, Learning, and Research

Poster

Identifying Learners' Cognitive-Affective Profiles in Virtual Scientific Inquiry Practices

Shuo Feng*, Shanghai Jiao Tong University, China

Maohua Wang, Shanghai Municipal Education Commission, China

Ke Li, Shanghai Jiao Tong University, China

Shuai Wang, Shanghai Jiao Tong University, China

Strand 6: Science Learning in Informal Contexts

Poster

Embracing a Pluriversal Approach in Science Education: Racialized Multilingual Youth as Epistemic Contributors and Sensemakers

Akira Harper*, University of Massachusetts Dartmouth, USA

Shakhnoza Kayumova, University of Massachusetts Dartmouth, USA

Fernanda Minghetti Weisheimer,
University of Massachusetts Dartmouth,
USA

Jared Fredette, University of
Massachusetts Dartmouth, USA

**Strand 8: In-service Science Teacher
Education
Poster**

*Science Teachers Visual
Representations of Nature of Science
through Online Reflective
Collaborative Professional
Development Program*
Büşra Aksöz*, Bogazici University, Turkey
Ebru Kaya, Bogazici University, Turkey

Multi-Strand Stand-Alone Paper Set 3

13-Mar-25, 2:00 PM-3:30 PM

Location: Zoom A

**Strand 2: Science Learning: Contexts,
Characteristics and Interactions
Stand-Alone Paper**

*Broadening Participation in STEM by
Engaging Students in Data Science in
Puerto Rico*

Steven McGee*, The Learning Partnership,
USA

Willow Kelleigh, The Learning Partnership,
USA

**Strand 7: Pre-service Science Teacher
Education**

Stand-Alone Paper

*Integrating Historical Empathy into
History of Science: Promoting Socio-
Emotional Competence in Pre-Service
Science Teacher.*

María Paz Beltrán*, Universidad del
Desarrollo, Chile

Francesca Grez, Universidad del
Desarrollo, Chile

**Strand 8: In-service Science Teacher
Education
Stand-Alone Paper**

*Noticings by Principals and Their
Responses to Elementary Science
Lessons*

Melissa Pearcy*, Washington State
University, USA

Meagan Graves, Washington State
University, USA

Patrick Ochieng, Washington State
University, USA

**Strand 8: In-service Science Teacher
Education**

Stand-Alone Paper

*Early Childhood Teachers'
Perspectives on Integrated STEM
Education*

Lu Wang*, Indiana University Kokomo,
USA

Alina Mihai, Indiana University Kokomo,
USA

**Strand 4: Science Teaching — Middle and
High School (Grades 5-12): Characteristics
and Strategies**

13-Mar-25, 2:00 PM-3:30 PM

Location: Zoom A

Stand-Alone Paper

*Effects of lab sequence and student
preferences, combining virtual and
physical labs in middle school*

Amnon Levin*, Ben-Gurion University,
Israel

Elon Langbeheim, Ben-Gurion University,
Israel

Stand-Alone Paper Set 4

Strand 5: College Science Teaching and Learning (Grades 13-20)

13-Mar-25, 2:00 PM-3:30 PM

Location: Zoom B

Stand-Alone Paper

AI in STEAM Education: case study of visual literacy in biology and visual art drawing

Michael Ahove*, Lagos State University, Nigeria

Benjamin Onuorah*, Lagos State University, Nigeria

Peter Okebukola, Lagos State University, Nigeria

Sanni Rasheed, Lagos State University, Nigeria

Juma Shabani, University of Burundi, Burundi

Stand-Alone Paper

Improving African Students Learning Outcomes in Cybersecurity, the Culturo-Techno-Contextual Approach and Afrocyberlibrary to the Rescue.

Michael Armah, Lagos State University, Nigeria

Peter Okebukola, Lagos State University, Nigeria

Moses Akanbi, Lagos State University, Nigeria

Rasheed Saani, Lagos State University, Nigeria

Andrew Tetteh, Lagos State University, Nigeria

Stand-Alone Paper

Improving Students Interests in Cybersecurity: Will the CTCA and Afrocyberlibrary Help?

Andrew Tetteh, Lagos State University, Nigeria

Michael Armah, Lagos State University, Nigeria

Peter Okebukola, Lagos State University, Nigeria

Moses Akanbi, Lagos State University, Nigeria

Rasheed Saani, Lagos State University, Nigeria

Stand-Alone Paper

Phenomenographic Analysis to Students' Problem Solving in Introductory Physics

Ozden Sengul*, Bogazici University, Turkey

Sevde Yerisenoglu, Bogazici University, Turkey

Stand-Alone Paper

2-Year College Biology Instructor Perceptions on Mathematics in Biology Instruction

Kristine Squillace Stenlund*, University of Minnesota, USA

Anita Schuchardt, University of Minnesota, USA

Principles for Designing Science Methods Courses Toward Humanizing Science Teaching and Learning

Strand 7: Pre-service Science Teacher Education

13-Mar-25, 4:00 PM-5:30 PM

Location: Zoom A

Symposium

Principles for Designing Science Methods Courses Toward Humanizing Science Teaching and Learning

D Keifert*, University of North Texas, USA

Bethany Daniel*, Vanderbilt University, USA

Heather Johnson, Vanderbilt University, USA

Déana Scipio*, IslandWood, USA
Yaa Dankwa*, The Ohio State University, USA
Sophia Jeong, The Ohio State University, USA
Alejandra Santely, The Ohio State University, USA
Khadija Zogheib*, Florida State University, USA
Enrique Suárez, University of Massachusetts Amherst, USA
Myeongji Kim, The Ohio State University, USA

Multi-Strand Stand-Alone Paper Set 5
13-Mar-25, 4:00 PM-5:30 PM
Location: Zoom B

Strand 6: Science Learning in Informal Contexts
Stand-Alone Paper

People who have more science education rely less on misinformation when making science-related decisions

Yael Rozenblum*, Technion – Israel Institute of Technology, Israel
Keren Dalyot, Weizmann Institute of Science, Israel
Ayelet Baram- Tsabari, Technion – Israel Institute of Technology, Israel

Strand 12: Technology for Teaching, Learning, and Research

Stand-Alone Paper
Effect of Technology-Education-Art (TEA) Artificial Intelligence Model on Students' Attitude towards Biological Drawing

Benjamin Onuorah*, Lagos State University, Nigeria

Peter Okebukola*, Lagos State University, Nigeria
Michael Ahove, Lagos State University, Nigeria
Sanni Rasheed, Lagos State University, Nigeria
Juma Shabani, University of Burundi, Burundi
Franklin Onowugbeda, Lagos State University, Nigeria

Strand 13: History, Philosophy, Sociology, and Nature of Science
Stand-Alone Paper

The Impact of Teaching Based on HOS on Students' Understanding of the Nature of Science
Kadriye İnci*, METU, Turkey
Semra Sungur, METU, Turkey
Özgül Yılmaz-Tüzün, METU, Turkey

Strand 14: Environmental Education and Sustainability
Stand-Alone Paper

Pre-service Science Teachers' Place-Based Learning Experience: A Bioblitz Activity in İhlara Valley
Nurcan Tekin, Aksaray University, Turkey
Başak Tepedelenlioğlu*, Aksaray University, Turkey

Strand 14: Environmental Education and Sustainability

Stand-Alone Paper
Relating Professional Action Competence in ESD to Sustainability Teaching Outcome Expectancy, ESD Value, Teacher Self-Regulation
Zeynep Aydin*, Bogazici University, Turkey
Sevda Yerdelen-Damar, Bogazici University, Turkey

Strand 14: Environmental Education and Sustainability

Stand-Alone Paper

Bridging Roles: Educators and High School Graduates' Sense of Climate Change.

Shaima Alokbe*, Ben-Gurion University of the Negev, Israel

Areej Nbari*, Ben-Gurion University of the Negev, Israel

Wisam Sedawi*, University of Michigan, USA

Orit Ben Zvi Assaraf, Ben-Gurion University of the Negev, Israel

Closing remarks

13-Mar-25, 5:30 PM-6:00 PM

Location: Zoom A

In-Person Conference 23 March 2025

New Member Welcome

23-Mar-25, 7:00 AM-8:00 AM

Location: Magnolia 3

Social Event

Challenging Academic Hegemony: How Latin@ Rethink Scholarly Conventions in Science Education Research

23-Mar-25, 8:00 AM-11:45 AM

Location: Annapolis 1

Pre-Conference Workshop

Organizers

Angela Chapman, University of Texas Rio Grande Valley, USA

Alejandro Gallard, Georgia Southern University, USA

Uma Ganesan, University of Texas Rio Grande Valley, USA

Panelists

S. Lizette Ramos De Robles, Nacional de Ciencia y Tecnología, Mexico

Verónica Serrano Flores, Instituto Superior de Investigación y Docencia para el Magisterio (ISIDM), Mexico

Dulce Gonzalez Ramírez, Instituto Superior de Investigación y Docencia para el Magisterio (ISIDM), Mexico

Liliana Garcia, University of California Santa Barbara, USA

Alexander Eden, Florida International University, USA

Summer Blanco, University of Georgia, USA

Empowering Innovative Teacher- Researcher Partnerships in Switzerland: A Collaborative Approach to Strengthen the Use of Conceptual & Affective Tests in Classrooms

23-Mar-25, 8:00 AM-11:45 AM

Location: Annapolis 2

Pre-Conference Workshop

Organizer

Florian Stern, University of Geneva, Switzerland

Another Essential Partner We Need in the Mix: Building Lasting Connections Among Science Teachers, Researchers, and EdTech Innovators

23-Mar-25, 8:00 AM-11:45 AM

Location: Annapolis 3

Pre-Conference Workshop

Organizers

Megan Conrad, ExploreLearning, USA

Panelists

Megan Conrad, ExploreLearning, USA

David Kantner, ExploreLearning, USA

William Penuel, University of Colorado Boulder, USA

Stefani Stephenson, Digital Promise, USA

The Pendulum: A Gateway to Authentic Scientific Research in High School Classrooms
23-Mar-25, 8:00 AM-11:45 AM
Location: Annapolis 4

Pre-Conference Workshop

Organizers

Brian Wargo, Idealized Science, USA

Presenters

Brian Wargo, Idealized Science, USA

Jacob Beckey, University of Colorado Boulder, USA

An Introduction to the VAScoR and Using a Rubric to Qualify Responses to the Views of Nature of Science (VNOS) Questionnaire

23-Mar-25, 8:00 AM-11:45 AM

Location: Baltimore 2

Pre-Conference Workshop

Organizers

Ryan Summers, University of North Dakota, USA

Presenters

Ryan Summers, University of North Dakota, USA

Sahar Alameh, University of Kentucky, USA

Jeanne Brunner, University of Massachusetts Amherst, USA

Fouiad Abd-El-Khalick, University of Massachusetts Amherst, USA

Equity and Ethics Practices in Science Education: Implications for Teaching and Research
23-Mar-25, 8:00 AM-11:45 AM
Location: Magnolia 3

Pre-Conference Workshop

Organizer

Maria Rivera Maulucci, Barnard College, Columbia University, USA

Ways of Knowing Nature: Exploring Piscataway Park

23-Mar-25, 8:00 AM-11:45 AM

Location: Offsite

Pre-Conference Workshop

Organizers

Julie Robinson, University of North Dakota, USA

Steph Dean, Clemson University, USA

Julie Robinson, University of North Dakota, USA

Graduate Student Luncheon

23-Mar-25, 11:45 AM-12:45 PM

Location: Cherry Blossom Ballroom

Social Event

Presidential Welcome

23-Mar-25, 1:00 PM-1:15 PM

Location: Woodrow Wilson Ballroom

Keynote Panel: What Science Teachers Say to Researchers

23-Mar-25, 1:15 PM-2:15 PM

Location: Woodrow Wilson Ballroom

Keynote Panel

Organizer

Jerome Shaw, University of California, Santa Cruz, USA

Panelists

Denise Masayesva, Chasing Butterflies Consulting, USA

Hellin Pietikäinen, Hetta Primary School, Finland

Jonathan Perez, Mervyn Dymally High School, USA

Saeed Maigari, Prime Academy, Nigeria

YiWen Hung, The Affiliated Senior High School of National Taiwan Normal University, Taiwan

Bridging Practice and Research: Perspectives on Achieving Stronger Mutual Impacts

23-Mar-25, 2:45 PM-4:15 PM

Location: Annapolis 4

Symposium

Organizers

Alexander Bohn, Northern Virginia Community College, USA

Karen Woodruff, Kean University, USA

Bryan Nichols, Florida Atlantic University, USA

Carrie-Anne Sherwood, Southern Connecticut State University, USA

Stephen Witzig, University of Massachusetts Dartmouth, USA

Beth Covitt, University of Montana, USA

Liam Guilfoyle, University of Oxford, United Kingdom

Mina Sedaghatjou, Rowan University, USA

James Nyachwaya, North Dakota State University, USA

Panelists

Rich DelVecchio, Hackensack Public Schools, NJ, USA

Bridget Miller, University of South Carolina, USA

Deb Morrison, University of Washington, USA

Empowering Learners: Emotional Awareness, Self-Evaluation, and Cultural Influences in Education

Strand 1: Science Learning: Development of student understanding

23-Mar-25, 2:45 PM-4:15 PM

Location: Azalea 3

Stand-Alone Paper

Teachers as Sponsors: Empowering Urban Youth for Success through Advanced Placement Enrollment.
Justina Ogodo*, Baylor University, USA

Stand-Alone Paper

Engaging Emotions: Fostering Critical Emotional Awareness in Climate Justice Education

Michael Lawson*, Kansas State University, USA

Imogen Herrick*, University of Kansas, USA

Stand-Alone Paper

Further Reflections on the Influence of Culture on Development of Science Process Skills

Peter Okebukola*, Africa Centre of Excellence for Innovative and Transformative STEM Education, Lagos State University, Nigeria

Moses Emmanuel, Africa Centre of Excellence for Innovative and Transformative STEM Education, Lagos State University, Nigeria

Joshua Akinpelu, Africa Centre of Excellence for Innovative and Transformative STEM Education, Lagos State University, Nigeria

Abdulazeez Balogun, Africa Centre of Excellence for Innovative and Transformative STEM Education, Lagos State University, Nigeria

Atinuke Adekoya, Africa Centre of Excellence for Innovative and Transformative STEM Education, Lagos State University, Nigeria

Stand-Alone Paper

Investigating cross-age gender differences in accuracy of self-evaluation about introductory astronomy topics

Silvia Galano*, University Federico II, Italy
Italo Testa, University Federico II, Italy

Innovative Practices bridging Language, Identity, and Equity in STEM Education

Strand 2: Science Learning: Contexts, Characteristics and Interactions

23-Mar-25, 2:45 PM-4:15 PM

Location: Annapolis 1

Stand-Alone Paper

A Systematic Review of Research on Translanguaging in Science, Technology, Engineering and Mathematics Education

Kason Ka Ching Cheung*, The Education University of Hong Kong, Hong Kong

Davy Ng Tsz Kit, The University of Hong Kong, Hong Kong

Stand-Alone Paper

I think I'm going to be an ingeniero: Translanguaging and engineering identity development

Kathryn Bateman*, Museum of Science, Boston, USA

Gregory Kelly*, University of Massachusetts, Amherst, USA

Peter Licona, Elizabethtown College, USA

Christine Cunningham, Museum of Science, Boston, USA

Stand-Alone Paper

Supporting Emergent Bilingual Students Understanding of Energy Through Equitable Teaching Practices

ANUPAM RAJ*, University of Massachusetts Dartmouth, USA

Shakhnoza Kayumova*, University of Massachusetts Dartmouth, USA

Exploring digitization in elementary science education

Strand 3: Science Teaching — Primary School (Grades preK-6): Characteristics and Strategies

23-Mar-25, 2:45 PM-4:15 PM

Location: Camellia 1

Stand-Alone Paper

Unveiling Young Students' Computational Thinking Strategies with Multiple Representations

Kristina Tank, Iowa State University, USA

Tamara Moore*, Purdue University, USA

Anne Ottenbreit-Leftwich, Indiana University, USA

Zarina Wafula, Iowa State University, USA

Sohheon Yang, Indiana University, USA

Lin Chu, Indiana University, USA

Stand-Alone Paper

AI Competencies for Elementary Students: A Comprehensive Literature Review and Implications for AI-integrated Science Education

Hui Yang*, SRI International, USA

Arif Rachmatullah*, SRI International, USA

Nonye Alozie, SRI International, USA

Yan-Ming Chiou, SRI International, USA

Stand-Alone Paper

Validating the App-Based Science and Engineering Practices Observation Protocol (SciEPOP) for Play-based Early Learning Environments

Alison Miller*, Bowdoin College, USA

Lauren Saenz, Bowdoin College, USA

Hildah Makori*, Bowdoin College, USA

Sadie Smith, Bowdoin College, USA

Lisa Kenyon, Maine Mathematics and Science Alliance, USA

Rachel Larimore, Samara Early Learning, USA

Maranda Chung, Maine Mathematics and Science Alliance, USA

Stand-Alone Paper

Enhancing Early Childhood Science and Engineering Practices through Professional Learning with the SciEPlay SEP Toolbox

Lisa Kenyon, Maine Mathematics and Science Alliance, USA

Rachel Larimore, Samara Early Learning, USA

Maranda Chung, Maine Mathematics and Science Alliance, USA

Hildah Makori*, Bowdoin College, USA

Alison Miller*, Bowdoin College, USA

Lauren Poniatowski, Bowdoin College, USA

Sadie Smith, Bowdoin College, USA

Moving toward more dynamic and holistic approaches to assessing students in science education

Strand 4: Science Teaching — Middle and High School (Grades 5-12): Characteristics and Strategies

23-Mar-25, 2:45 PM-4:15 PM

Location: Baltimore 4

Stand-Alone Paper

Rethinking Assessments in Science: A Teacher's Journey to Expand Accepted Knowledge and Ways of Knowing

Lindsay Wells*, University of Wisconsin - Madison, USA

Aaron Burg, Badger High School, USA

Ryan Stowe, University of Wisconsin - Madison, USA

Stand-Alone Paper

Alternative Assessment in High School Chemistry Exploring Teachers' Knowledge and Perceptions
Shirly Avargil*, Technion, Israel
Karen Sokolov, Bar Ilan University, Israel

Stand-Alone Paper

Teacher Use of 3D Assessments to Assess Student Learning and Provide Feedback
Jonathan Bowers*, Michigan State University, USA
Peng He, Washington State University, USA

**Undergraduate Research:
Challenges, Benefits, and Learning Outcomes**
Strand 5: College Science Teaching and Learning (Grades 13-20)
23-Mar-25, 2:45 PM-4:15 PM
Location: Magnolia 3

Stand-Alone Paper

*What are the Benefits and Challenges of Undergraduate Research?
Perspectives from Undergraduate Students*
Hayden Criswell*, University of Oklahoma, USA
Jacob Pleasants, University of Oklahoma, USA

Stand-Alone Paper

Using Course-based Undergraduate Research to Expand Student Understanding of Quantum Phenomena in Biological Chemistry
Joi Walker*, East Carolina University, USA

Clark Andersen, East Carolina University, USA

Evan Brinkley, East Carolina University, USA

Adam Offenbacher, East Carolina University, USA

Stand-Alone Paper

Experimental design skill may transfer to a scientific literacy skill in undergraduate introductory biology
Scott Kreher*, Dominican University, USA
Christopher Anderson, Dominican University, USA
Carissa Buber, Dominican University, USA
James Cerven, Dominican University, USA

Stand-Alone Paper

Exploring socially mediated metacognition in small group discussions during undergraduate biology laboratory courses
Asghar Gill, University of Nebraska Lincoln, USA
Lyrica Lucas, University of Nebraska Lincoln, USA
Jenny Dauer, University of Nebraska Lincoln, USA
Tomas Helikar, University of Nebraska Lincoln, USA
Joseph Dauer, University of Nebraska Lincoln, USA

Innovative Approaches in Informal Science Education

Strand 6: Science Learning in Informal Contexts

23-Mar-25, 2:45 PM-4:15 PM

Location: Magnolia 1

Stand-Alone Paper

Middle School Youths Identity Play as Investigators, Futurists, and Advocates During Critical Place-Based Learning

Heidi Carlone*, Vanderbilt University, USA

Hannah Ziegler, Vanderbilt University, USA

Tessaly Jen, Vanderbilt University, USA

Jingyi Chen, Vanderbilt University, USA

Zachary Conley, Vanderbilt University, USA

Alison Mercier, University of Wyoming, USA

Stand-Alone Paper

Making sense of a science-related poem by means of visual representations

Wilmo Francisco Junior*, Universidade Federal de Alagoas, Brazil

Miyuki Yamashita, Universidade Federal de Alagoas, Brazil

Stand-Alone Paper

Science in Third Spaces: Exploring Community Motivations at Informal Brewery Events

Jill Zipperer*, Texas State University, USA

Carolyn Jess, Texas State University, USA

Carrie Bucklin, Texas State University, USA

Kristy Daniel, Texas State University, USA

Exploring AI in Teacher Education

Strand 7: Pre-service Science Teacher Education

23-Mar-25, 2:45 PM-4:15 PM

Location: Baltimore 1

Stand-Alone Paper

Pre-service Teachers' Interactions with an Artificial Intelligence Agent during Theory Testing on Diffusion

Marios Papaevripidou*, University of Cyprus, Cyprus

Yvoni Pavlou, University of Cyprus, Cyprus

Theodoros Karafyllidis, University of

Cyprus, Cyprus

Zacharias Zacharia, University of Cyprus, Cyprus

Tamar Fuhrmann, Teachers College,

Columbia University, USA

Stand-Alone Paper

AI Readiness and Preservice Secondary Science Teachers

Adam Bennion*, Brigham Young University, USA

Stand-Alone Paper

Investigating Factors Contributing to Pre-service Teachers' Acceptance of Artificial Intelligence in Education

Shuchen Guo, Nanjing Normal University, China

Xiaoming Zhai, University of Georgia, USA

Stand-Alone Paper

Coding to Learn Science, Science to Learn Coding: Intersections Between Computational, Modeling and Data Practices

Cassia Fernandez, University of São Paulo, Brazil

Tamar Fuhrmann*, Teachers College, Columbia University, USA

Advancing Teacher Professional Development: Scaling, Communities, and Impact

Strand 8: In-service Science Teacher Education

23-Mar-25, 2:45 PM-4:15 PM

Location: Annapolis 3

Stand-Alone Paper

Supporting STEMM Professional Development through Explicit Community of Practice Opportunities

Matthew Blank*, Baylor College of Medicine, USA

Alana Newell, Baylor College of Medicine, USA

Nancy Moreno, Baylor College of Medicine, USA

Stand-Alone Paper

Effects of a Professional Development Program related to Scientific Reasoning on Teachers, Instruction and Students

Richard Sannert*, IPN - Leibniz Institute for Science and Mathematics Education, Germany

Verena Petermann, Justus Liebig University, Germany

Janet Carlson, Stanford University, USA

Jan van Driel, The University of Melbourne, Australia

Moritz Krell, IPN - Leibniz Institute for Science and Mathematics Education, Germany

Stand-Alone Paper

Exploring Barriers to Scaling an Effective Teacher Professional Learning Program

Chris Wilson*, BSCS Science Learning, USA

Taylor Joseph, American Institutes for Research, USA

Amy Belcastro, BSCS Science Learning, USA

Jody Bintz, BSCS Science Learning, USA

Jenine Cotton-Proby, BSCS Science Learning, USA

Cindy Gay, BSCS Science Learning, USA

Janna Mahfoud, BSCS Science Learning, USA

Guy Ollison, BSCS Science Learning, USA

Molly Stuhlsatz, BSCS Science, USA

Bo Zhu, American Institutes for Research, USA

Stand-Alone Paper

Resource Networks Development and Their Impact on Implementing Digital Innovation in Physics Classrooms

Jaika Hott*, IPN, Germany

Stefan Sorge, IPN, Germany

Knut Neumann, IPN, Germany

Reflective Practices in Science Education: Discourse, Feedback, and Professional Development

Strand 8: In-service Science Teacher Education

23-Mar-25, 2:45 PM-4:15 PM

Location: Annapolis 2

Stand-Alone Paper

Negotiating Physics Teachers' Interpretations of Inequitable Patterns in Classroom Data During Coaching Sessions

Linsey Brennan*, Michigan State University, USA

Sunghwan Byun, North Carolina State University, USA

Julie Christensen, Michigan State University, USA

Nickolaus Ortiz, Georgia State University, USA

Niral Shah, University of Washington, USA

Daniel Reinholtz, San Diego State University, USA

David Stroupe, University of Utah, USA

Marcos Caballero, Michigan State University, USA

Stand-Alone Paper

Reflective or Directive? Analyzing High School Science Mentors Written Feedback Comments on Mentees Recorded Lessons

Lynn Huff*, North Carolina State University, USA

Soonhye Park, North Carolina State University, USA

Grace Carroll, North Carolina State University, USA

Laura Chalfant, North Carolina State University, USA

William Reynolds, North Carolina State University, USA

Scott Ragan, North Carolina State University, USA

Jason Painter, North Carolina State University, USA

Stand-Alone Paper

Facilitation strategies responding to emotional displays in PD discourse: Navigating social and learning goals

Dana Vedder Weiss*, Ben Gurion University of the Negev, Israel

Rotem Trachtenberg Maslaton, Ben Gurion University of the Negev, Israel

Karin Tsarfati Shaulov, Ben Gurion University of the Negev, Israel

Centering Equity in Science

Curriculum and Pedagogy

Strand 10: Curriculum and Assessment

23-Mar-25, 2:45 PM-4:15 PM

Location: Magnolia 2

Stand-Alone Paper

Historically Relevant Science

Pedagogy: Beyond Representation

Moving Towards Critical Consciousness

Alexis Riley*, New York University - Steinhardt, USA

Stand-Alone Paper

Teachers' customization of curriculum: Professional learning to center equity in the customization process

Katherine McNeill*, Boston College, USA

Austin Moore, Boston College, USA

Maria Moreno Vera, Boston College, USA

Samuel Lee, California State University, Long Beach, USA

Renee Affolter, OpenSciEd, USA

Stand-Alone Paper

In-Service Science Teachers' Perceptions and Enactment of Equity from Employing Digitally-Delivered Educative Curriculum Materials

Rebecca Hite*, Texas Tech University, USA

Advocating for Gender Equity in

Science Higher Education

Strand 11: Cultural, Social, and Gender Issues

23-Mar-25, 2:45 PM-4:15 PM

Location: Azalea 1

Stand-Alone Paper

Empowering Women in Physics: Exploring How Leadership, Mentorship, and Career Conceptualization Shape Undergraduates' Physics Identity
Laura Akesson*, George Mason University, USA

Jessica Rosenberg*, George Mason University, USA

Nancy Holincheck*, George Mason University, USA

Benjamin Dreyfus, George Mason University, USA

Rocio Quiroga-Velasquez, George Mason University, USA

Julia Lipman*, George Mason University, USA

Stand-Alone Paper

Care, relationality and conflict in a geoscience department

Sarah El Halwany*, Université de l'Ontario français, Canada

Maryam Taheri, University of Calgary, Canada

Jennifer Adams, University of Calgary, Canada

Stand-Alone Paper

"I'm gay and Latino, but I'm still a man": Experiences of non-tenure track science faculty

Katherine Doerr*, Malmö University, Sweden

Stand-Alone Paper

A Critical Examination of How Physics Professors Describe Women in Physics Using Feminist Standpoint Theory
Christy Metzger*, University of Delaware, USA

Stand-Alone Paper

Enhancing Professional Vision in Gender-Sensitive Physics Education: Predictors and Implications for Teacher Training

Sanja Atanasova*, University of Teacher Education St.Gallen, Switzerland

Nicolas Robin, University of Teacher Education St.Gallen, Switzerland

Dorothee Brovelli, University of Teacher Education Lucerne, Switzerland

Exploring Critical Epistemologies in Science Education

Strand 11: Cultural, Social, and Gender Issues

23-Mar-25, 2:45 PM-4:15 PM

Location: Azalea 2

Stand-Alone Paper

Bioethics as a Racial Project: Positionality and Ethics in Science
Matthew Weinstein*, University of Washington-Tacoma, USA

Stand-Alone Paper

Responding to CRT and DEI Prohibitions with QuantCrit and "Post" Methods

Christopher Irwin*, Florida International University, USA

Stand-Alone Paper

Science Teacher Leaders' Grappling with the Role of Race in Science Content Knowledge Production
Althea Roy*, Clemson University, USA
Kristen Duncan, Clemson University, USA
Brooke Whitworth, Clemson University, USA
Julianne Wenner, Clemson University, USA

Stand-Alone Paper

Decolonizing Science Education Research and Practice: Introducing the Islamic Philosophical Perspective of Wasatiyyah
Zahra Hazari*, Florida International University, USA
Amal Ibourk, Florida State University, USA
Hulya Avci, Florida International University, USA
Shakhnoza Kayumova, University of Massachusetts Dartmouth, USA

AI and Future STEM Education

Strand 12: Technology for Teaching,

Learning, and Research

23-Mar-25, 2:45 PM-4:15 PM

Location: Baltimore 5

Stand-Alone Paper

Bridging the Gap: Perceived vs. Actual Ethical Awareness in AI among Future Engineers and Scientists
Maya Usher, Technion - Israel Institute of Technology, Israel
Miri Barak*, Technion - Israel Institute of Technology, Israel

Stand-Alone Paper

How Should We Utilize AI for Science Learning? A Discussion Based on Systematic Review
Xinyu He*, university of georgia, USA
Emily Adah Miller, university of georgia, USA
Tingting Li, washington state university, USA

Stand-Alone Paper

Using Large Language Models to Analyze Students' Hands-on Responses and Support Teachers' Timely Instructional Decisions
Peng He*, Washington State University, USA

Stand-Alone Paper

Comparative Analysis of AI Chatbots' Impact on Scientific Inquiry and Misconceptions in Biochemistry
Rıdvan Elmas*, Afyon Kocatepe University, Turkey
Merve ADIGUZEL-ULUTAS, Gazi University, Turkey
Mehmet YILMAZ, Gazi University, Turkey

Nature of Science and Argumentation

Strand 13: History, Philosophy, Sociology,

and Nature of Science

23-Mar-25, 2:45 PM-4:15 PM

Location: Baltimore 2

Stand-Alone Paper

Consistency of Nature of Science Conceptions and Argumentation Skills
Rola Khishfe*, American University of Beirut, Lebanon

Stand-Alone Paper

Designing Discussion Questions for Nature of Science Read-Alouds

Jeanne Brunner*, University of Massachusetts Amherst, USA

Stand-Alone Paper

Argument Driven Inquiry in Practice: Patterns and Variations in Teachers' Knowledge

Brendan Callahan*, Kennesaw State University, USA

Michael Dias, Kennesaw State University, USA

Education for Sustainable Development

Strand 14: Environmental Education and Sustainability

23-Mar-25, 2:45 PM-4:15 PM

Location: Baltimore 3

Stand-Alone Paper

Student Competences in Education for Sustainable Development: Are teachers on board?

Tuba Stouthart, Eindhoven University of Technology, Netherlands

Duru Bayram*, Eindhoven University of Technology, Netherlands

Jan van der Veen, Eindhoven University of Technology, Netherlands

Stand-Alone Paper

From attitudes to action: an integrated model for sustainability education

Tessa Baierl, University of Bayreuth, Germany

Juergen Paul, University of Bayreuth, Germany

Franz Bogner, University of Bayreuth, Germany

Stand-Alone Paper

Exploring Teachers' Holistic Perceptions of Sustainability Education in Urban and Rural Schools

Rolf Saarna, University of Tartu, Estonia
Anne Laius, University of Tartu, Estonia

Reframing Science and Engineering: Teachers' Strategies for Indigenizing STEM Education

23-Mar-25, 4:30 PM-6:00 PM

Location: Annapolis 4

Administrative Session

Reframing Science and Engineering: Teachers' Strategies for Indigenizing STEM Education

Organizers

Julie Robinson, University of North Dakota, Grand Forks, USA

Pauline Chinn, University of Hawaii at Manoa, USA

Panelists

Lenora Crabtree, University of North Carolina Charlotte, USA

Woei Hung, University of North Dakota, Grand Forks, USA

Paichi Shein, National Sun Yat-sen University, Taiwan

Stacy Potes, University of Hawai'i at Mānoa, USA

Stephanie Erickson, University of Minnesota, USA

Bhaskar Upadhyay, University of Minnesota, USA

Dimitri Smirnoff, University of Minnesota, USA

Devin Caverio, University of California-Berkeley, USA

Mehmet Yilmaz, Gazi University, Turkey

Research on Creativity of Students in Integrated STEM Education: A Scoping Review

Strand 1: Science Learning: Development of student understanding

23-Mar-25, 4:30 PM-6:00 PM

Location: Azalea 3

Stand-Alone Paper

How Might a STEM Integrated Curriculum Influence Students' Design Thinking?

Dina Thomason*, UTEP, USA

Pei-Ling Hsu, UTEP, USA

Stand-Alone Paper

Creativity in Science Education – A Scoping Review

Annette Upmeier zu Belzen*, Humboldt-Universität zu Berlin, Germany

Paul Engelschalt, Humboldt-Universität zu Berlin, Germany

Leroy Großmann, Freie Universität Berlin, Germany

Dirk Krüger*, Freie Universität Berlin, Germany

Stand-Alone Paper

Research on Creativity of Students in Integrated STEM Education: A Scoping Review

Shuaishuai Mi*, Faculty of Education, University of Macau, Macao

Xiufeng Liu, Faculty of Education, University of Macau, Macao

Stand-Alone Paper

Implementation of Engineering Design Process for Gifted Students: A Case of Science and Art Centers

Merve Adiguzel-Ulutas*, Gazi University, Turkey

Centering Affect and Emotion Toward Justice and Dignity in Science Education

Strand 2: Science Learning: Contexts, Characteristics and Interactions

23-Mar-25, 4:30 PM-6:00 PM

Location: Annapolis 1

Related Paper Set

Affective politics of belonging to STEM
Sarah El Halwany*, Université de l'Ontario français, Canada

Jennifer Adams*, University of Calgary, Canada

Related Paper Set

Emotional Configurations of Whiteness in Learning to Teach Science in Anti-racist Ways

Jonathan McCausland*, Iona University, USA

Related Paper Set

"That's just gonna make them upset": Youth authoring emerging epistemic ideals through rightful presence

Rishi Krishnamoorthy*, University of Toronto, Canada

Ravit Golan Duncan, Rutgers University, USA

Edna Tan, University of North Carolina - Greensboro, USA

Related Paper Set

Elevating Configurations of Data and Emotion: Dynamics of Co-production and Competition

Kathryn Lanouette*, William & Mary, USA

Related Paper Set

'How do these data make you feel?':
Emotional Pathways During Data Talks about Climate Justice
Imogen Herrick*, University of Kansas, USA
Michael Lawson, Kansas State University, USA
Ananya Matewos, Wilder Foundation, USA

Navigating Argumentation and Evidence in Science Education

Strand 2: Science Learning: Contexts, Characteristics and Interactions
23-Mar-25, 4:30 PM-6:00 PM
Location: Magnolia 2

Stand-Alone Paper

Students Knowledge and Sources of Information for Viruses and Vaccines: A Mixed Methods Study
Madeline Stallard*, North Carolina State University, USA
M. Gail Jones, North Carolina State University, USA
Julianna Nieuwsma, North Carolina State University, USA
Kathleen Bordewieck, North Carolina State University, USA
Tanzimul Ferdous, North Carolina State University, USA
Amber Meeks, North Carolina State University, USA

Stand-Alone Paper

Relationships Between Middle School Students' Epistemological Beliefs and Argumentation Quality in Genetically Modified Organisms
Burcu Bostancı*, Middle East Technical University, Turkey

Özgül Yılmaz-Tüzün, Middle East Technical University, Turkey

Stand-Alone Paper

Artificial Intelligence in Science Education Research: A systematic Review of NARST 2024
Gyeong-Geon Lee*, National Institute of Education, Singapore
Minji Yun*, University of Florida, USA
Xiaoming Zhai, University of Georgia, USA
Kent Crippen, University of Florida, USA

Stand-Alone Paper

Middle School Students' Use of and Rhetorical References to Inscriptions in Genetically Modified Organisms
Özgül Yılmaz-Tüzün*, Middle East Technical University, Turkey
Burcu Bostancı, Middle East Technical University, Turkey

Exploring strategies to enhance student engagement and learning outcomes across educational contexts

Strand 4: Science Teaching — Middle and High School (Grades 5-12): Characteristics and Strategies
23-Mar-25, 4:30 PM-6:00 PM
Location: Baltimore 4

Stand-Alone Paper

The Paradox of Project-based Learning in Chinese Science Education Reformation
Jiaojiao Hui*, The University of Hong Kong, China
Jiaxin Chen*, The University of Hong Kong, China
Yongping Shao, Hangzhou Yinhua Experimental Middle School, China

Chen Chen, The University of Hong Kong, China

Stand-Alone Paper

Model-Based Inquiry: Designing for Opportunities to Learn

Ron Gray*, Northern Arizona University, USA

Todd Campbell*, University of Connecticut, USA

Yue Bai*, University of Connecticut, USA

Stand-Alone Paper

*From Anxiety to Confidence:
Unlocking the Potential of CTCA in ICT Education*

Chinyere Ikpah, Lagos State University-Africa Centre of Excellence for Innovative and Transformative STEM Education, Nigeria

Peter Okebukola*, Lagos State University-Africa Centre of Excellence for Innovative and Transformative STEM Education, Nigeria

Rahman Alade, Lagos State University-Africa Centre of Excellence for Innovative and Transformative STEM Education, Nigeria

Rasheed Sanni, Lagos State University-Africa Centre of Excellence for Innovative and Transformative STEM Education, Nigeria

Deborah Agbanimu, National Open University of Nigeria, Nigeria

Problem-Solving and Engagement in Undergraduate Physics Education

Strand 5: College Science Teaching and Learning (Grades 13-20)

23-Mar-25, 4:30 PM-6:00 PM

Location: Magnolia 3

Stand-Alone Paper

Changes in physics freshmens prior knowledge A comparison of the German 2013 and 2023 cohort

Dennys Gahrmann*, Physics Education, Institute of Physics and Astronomy, University of Potsdam, Germany

Irene Neumann, Leibniz Institute of Science and Mathematics Education (IPN), Germany

Andreas Borowski, Physics Education, Institute of Physics and Astronomy, University of Potsdam, Germany

Stand-Alone Paper

How Students Use Knowledge Resources to Solve Problems in a Problem-Solving First Lesson

Cheng-Wen He*, University of Georgia, USA

Logan Fiorella, University of Georgia, USA

Paula Lemons, University of Georgia, USA

Stand-Alone Paper

Exploring Student Success In Undergraduate Physics Using A Hybrid Of Problem-Solving and Retrieval Practice Prompts

Carina Rebello*, Toronto Metropolitan University, Canada

Winter Allen, Purdue University, USA

Mina Megally, Toronto Metropolitan University, Canada

Atish Kabiraj, Toronto Metropolitan University, Canada

Stand-Alone Paper

Comparing engagement and cognitive load between game-based, inquiry-based, and design-based labs in introductory undergraduate physics
Razan (Rosie) Hamed*, Purdue University, USA
N. Sanjay Rebello, Purdue University, USA

Family and Community Pathways to STEM Learning

Strand 6: Science Learning in Informal Contexts
23-Mar-25, 4:30 PM-6:00 PM
Location: Magnolia 1

Stand-Alone Paper

Comparing Three Models of Family STEM Conversations for Broadening STEM Participation

Cory Buxton*, Oregon State University, USA
Diana Crespo-Camacho*, Oregon State University, USA
Barbara Ettenauer, Oregon State University, USA

Stand-Alone Paper

Parents' Noticing of Opportunities to Trigger and Foster Science Interest in Everyday Life

Irit Vivante*, Ben-Gurion University, Israel
Dana Vedder-Weiss*, Ben-Gurion University, Israel

Stand-Alone Paper

Exploring the effects of parent-child inquiry-based co-learning on children's scientific interest and self-efficacy

Zuway-R Hong*, Chung Shan Medical University, Taiwan

Li-ting Cheng, National Dong Hwa University, Taiwan

Huann-shyang Lin*, National Sun Yat-sen University, Taiwan

Ing-jer Huang, National Sun Yat-sen University, Taiwan

Thomas Smith, Northern Illinois University, USA

Stand-Alone Paper

Gaining insight into Rural, Underserved Students Experiences of an At-home, Justice-Centered STEM Curriculum

Margaret Blanchard*, North Carolina State University, USA
Karen Collier*, Augusta University, USA
Ana-Maria Topliceanu*, North Carolina State University, USA

Approaches to enhance STEM teaching

Strand 7: Pre-service Science Teacher Education
23-Mar-25, 4:30 PM-6:00 PM
Location: Baltimore 1

Stand-Alone Paper

The Impact of Field Placements on Pre-Service Teachers' Self-Efficacy Related to Teaching STEM: A Review
Lillian Bentley*, Georgia State University, USA

Xin Xia, University of Virginia, USA
Robert Tai, Australia Catholic university, Australia
Xitao Fan, The Chinese university of hing Kong, China

Stand-Alone Paper

Pre-Service Science and Mathematics Teachers' Perceptions of STEM Education: Towards a STEM Teacher Education Framework
Hopegay Williams*, The University of the West Indies, Mona, Jamaica
Sharon Bramwell-Lalor, The University of the West Indies, Mona, Jamaica
Aldrin Sweeney, Ross University School of Medicine, Barbados

Stand-Alone Paper

Does grouping influence STEM and non-STEM major pre-service teachers' acquiring STEM teaching competence
Hsiao-Lin Tuan*, National Changhua University of Education, Taiwan
Chi-Chin Chin, National Taichung University of Education, Taiwan
Li-Yu Huang, National Changhua University of Education, Taiwan
Fen-Mei Chou, Changhua City Teacher Center, Taiwan
Chien-Ying Chou, National Changhua University of Education, Taiwan

Stand-Alone Paper

Cognitive Aspect of Collaborative Problem-Solving Skills of Pre-Service Science Teachers Through STEM Activities
Ayşe Şatgeldi*, Middle East Technical University, Turkey
Ömer Özdemir, Middle East Technical University, Turkey
Ufuk Yıldırım, Middle East Technical University, Turkey

Examining Science Teacher Efficacy, Beliefs, and Inclusivity

Strand 8: In-service Science Teacher Education
23-Mar-25, 4:30 PM-6:00 PM
Location: Annapolis 3

Stand-Alone Paper

Investigating Elementary Teachers' Self-Efficacy in Science and Engineering Throughout a Year-Long Online Professional Learning Program
Ryan Summers*, University of North Dakota, USA
Rebekah Hammack, Purdue University, USA
Ashley Iveland, WestEd, USA
Meghan Macias, WestEd, USA
John Galisky, WestEd, USA
Michael Herbert, University of North Dakota, USA

Stand-Alone Paper

Exploring Secondary Science Teachers' Motivations, Goals, and Epistemological Beliefs in Reform-Oriented Professional Development Program

Khalid Alharbi*, North Carolina State University, USA
Soonhye Park*, North Carolina State University, USA
Grace Carroll*, North Carolina State University, USA
Laura Chalfant, North Carolina State University, USA
Elizabeth Kluckman, North Carolina State University, USA
William Reynolds, North Carolina State University, USA
Scott Ragan, North Carolina State University, USA
Jason Painter, North Carolina State University, USA

Stand-Alone Paper

Participant Perceptions About the Value of a Professional Development Program for Biology Teachers from Mexico

Gonzalo Peñaloza*, Centro de Investigació y de Estudios Avanzados del IPN, Unidad Monterrey, Mexico

María Guerra Ramos, Centro de Investigació y de Estudios Avanzados del IPN, Unidad Monterrey, Mexico

Zulmarie Pérez Horta, Science and Educational Media Group, Howard Hughes Medical Institute, USA

Javier Robalino, Science and Educational Media Group, Howard Hughes Medical Institute, USA

Tatiana Salazar López,Centro de Investigació y de Estudios Avanzados del IPN, Unidad Monterrey, Mexico

Irwing Vásquez Cerqueda, Centro de Investigació y de Estudios Avanzados del IPN, Unidad Monterrey, Mexico

Stand-Alone Paper

Impact of Gender and Sexual Diversity-Inclusive Professional Development on Rural Science Teachers' Attitudes and Beliefs

Gary Wright*, University of Missouri, USA

Austin Gaskin, University of Missouri, USA

Exploring Methodologies in Education Research: Insights and Applications from Early Career Scholars

Strand 10: Curriculum and Assessment

23-Mar-25, 4:30 PM-6:00 PM

Location: Annapolis 2

Symposium

Exploring Methodologies in Education Research: Insights and Applications from Early Career Scholars

Evelyn Boyd*, University of Mississippi, USA

Elizabeth Vaughan*, Reed College, USA

Katherine Doerr, Malmö University, Sweden

Emine Topalcengiz, University of Arkansas, USA

Jonathan Barcelo, Saint Louis University, Philippines

Advancing Multilingualism in Science Education

Strand 11: Cultural, Social, and Gender Issues

23-Mar-25, 4:30 PM-6:00 PM

Location: Azalea 1

Stand-Alone Paper

Creating a third space for multilingual learners through intertextuality: How are science textbooks faring?

Sara Salloum*, Ohio University, USA

Rana Baddour, American University of Beirut, Lebanon

Saouma BouJaoude, American University of Beirut, Lebanon

Stand-Alone Paper

Shifts towards heteroglossic ideologies and pedagogical translanguaging

through researcher-practitioner collaborative design of middle-school science curricula
Haemin Kim*, University of Houston, USA
Zhenjie Hou, University of Houston, USA
Araceli Enriquez-Andrade*, University of Houston, USA
Jie Zhang, University of Houston, USA
Mimi Lee, University of Houston, USA
Hien Tran, University of Houston, USA
Sissy Wong, University of Houston, USA
May JadAllah, University of Houston, USA

Stand-Alone Paper

Multilingual College Students Blending Linguistic Experimentation with Science Learning
Margaret Jeong, University of Illinois Chicago, USA
Adeesha Jayathilaka, University of Illinois Chicago, USA
Minjung Ryu, University of Illinois Chicago, USA

Creating a rightful presence for LGBTQ+ people in STEM

Strand 11: Cultural, Social, and Gender Issues
23-Mar-25, 4:30 PM-6:00 PM
Location: Azalea 2

Related Paper Set

Social Supports for Nonbinary Scientists: An Autoethnography on a Transdisciplinary Collaboration in LGBTQ-Inclusive STEM Scholarship
Ezra Kottler*, University of the Pacific, USA
Adrian Gentry, Purdue University, USA
Emily Haluschak*, Purdue University, USA
K. "Ren" Mendoza*, University of Nebraska at Omaha, USA

Riley DeHority, Virginia Tech, USA
Parker Lund, University of British Columbia, Canada
Miriam Backens, University of Lorraine, France

Related Paper Set

Spilling tea and kikis: Counternarrative explorations of a high school biology teacher
Khanh Tran*, Purdue University, USA

Related Paper Set

Queering the Scientific Method: How Rosalind Franklin's DNA Work "Reveals" the Queer Nature of Inquiry
Alexander Paulchell*, University of Arizona, USA
Kristin Gunckel, University of Arizona, USA

Related Paper Set

Designing effective LGBTQ inclusive science curricula and assessing pseudoscientific anti-LGBTQ bias in students
Charlie Blake*, Southern Illinois University Edwardsville, USA

Related Paper Set

Imagining Queer Past, Present, and Future Selves in STEM through Manga
Lisa Lundgren*, Utah State University, USA
Mario Suárez, Utah State University, USA
Colby Tofel-Grehl, Utah State University, USA

AI in Education Evaluation and Feedback

Strand 12: Technology for Teaching, Learning, and Research

23-Mar-25, 4:30 PM-6:00 PM

Location: Baltimore 5

Stand-Alone Paper

Multilingual Automated Scoring: Enhancing Equity in Science Education with NLP-SCR Across Polysemous Languages

Van Ngo*, Graduate Institute of Science Education, National Taiwan Normal University, Taiwan

John Lin, Graduate Institute of Science Education, National Taiwan Normal University, Taiwan

Chun-Yen Chang, Graduate Institute of Science Education, National Taiwan Normal University, Taiwan

Stand-Alone Paper

Cognitive synergy of human intelligence and artificial intelligence in designing equitable science assessments

Tingting Li*, Washington State University, USA

Stand-Alone Paper

Knowing Lecturer through Cyber-Security Students' Eyes, an Insights for Teaching Success with Machine Learning Algorithms

Michael Adewusi*, Kampala International University, Uganda

Ola Odekeye, Osun State University, Nigeria

Adeshina Adebajo, Lagos State University, Nigeria

Stand-Alone Paper

Integrating Open-Source LLMs for Automatic Feedback into Physics Classes

André Meyer*, Leibniz University Hannover - Physics Education Group, Germany

Tom Bleckmann, Leibniz University Hannover - Physics Education Group, Germany

Gunnar Friege, Leibniz University Hannover - Physics Education Group, Germany

Uncertainty, Perspective Taking and Reasoning in Science

Strand 13: History, Philosophy, Sociology, and Nature of Science

23-Mar-25, 4:30 PM-6:00 PM

Location: Baltimore 2

Stand-Alone Paper

Towards an Integrative Framework on Uncertainty in Science Teaching

Simon Blauza*, University of Münster, Centre for Biology Education, Germany

Kerstin Kremer, Justus Liebig University, Institute for Biology Education, Germany

Benedikt Heuckmann, University of Münster, Centre for Biology Education, Germany

Stand-Alone Paper

Dealing with Uncertainty in Science Education: A Systematic Review

Isa Korfomacher*, University of Münster, Centre for Biology Education, Germany

Christiane Konnemann, University of Münster, Centre for Biology Education, Germany

Marcus Hammann, University of Münster, Centre for Biology Education, Germany

Stand-Alone Paper

Suffering as a lens through which to motivate socioscientific perspective taking

David Owens*, University of Montana, USA
Robert Warner, University of Utah, USA
Mark Newton, East Carolina University, USA

Stand-Alone Paper

Futures Reasoning for Science Education

Senay Purzer*, Purdue University, USA
Duru Bayram*, Eindhoven University of Technology, Netherlands
Nazan Bautista*, Miami University, USA

Climate Change

Strand 14: Environmental Education and Sustainability
23-Mar-25, 4:30 PM-6:00 PM
Location: Baltimore 3

Stand-Alone Paper

New Jersey Elementary Teachers' Professional Learning about Climate Change

Lauren Madden*, The College of New Jersey, USA

Stand-Alone Paper

Teachers' Perceptions of Climate Science Uncertainty and Concerns about Implementing Climate Change Education

Ren-Ping Li*, Graduate Institute of Science Education, National Taiwan Normal University, Taiwan

Shiang-Yao Liu, Graduate Institute of Science Education, National Taiwan Normal University, Taiwan

Stand-Alone Paper

Fostering Agency and Decision-Making in Dealing With Climate Change: A Three-Lenses Approach

Giulia Tasquier*, ALMA MATER STUDIORUM - University of Bologna, Italy
Francesca Pongiglione, Vita-Salute S. Raffaele University, Italy
Elena Ricci, University of Verona, Italy

Stand-Alone Paper

Beyond their carbon footprints: Secondary school students' hope and action in face of climate change

Veronika Winter, University of Vienna, Austria

Miloslav Kolenatý, J. E. Purkyně University, Czech Republic

Jan Činčera, Masaryk university, Czech Republic

Andrea Möller*, University of Vienna, Austria

Supporting Policy Infrastructure in Computer Science and Engineering

Strand 15: Policy, Reform, and Program Evaluation
23-Mar-25, 4:30 PM-6:00 PM

Location: Camellia 1

Stand-Alone Paper

Determining Essential Computer Science Content for High School Students

Julie Smith*, Institute for Advancing Computing Education, USA

Monica McGill, Institute for Advancing Computing Education, USA

Jacob Koressel, Computer Science Teachers Association, USA

Bryan Twarek, Computer Science
Teachers Association, USA

Stand-Alone Paper

*Working Across Boundaries:
Examining the Computer Science
Education Social Networks Within
States*

Stefanie Marshall*, Michigan State
University, USA
Ain Grooms, University of Wisconsin, USA
Joshua Childs, University of Texas, USA
SJ Hemmerich*, University of Wisconsin,
USA
Grace Tukurah*, Michigan State University,
USA

Stand-Alone Paper

*Inventing the Inventor: Identifying the
capacities needed to be an inventive
problem solver.*

Adam Maltese, Indiana University, USA
Lauren Penney, Indiana University, USA
Kelli Paul*, Indiana University, USA
Peter Wardrip, University of Wisconsin,
USA
Joanna Garner, Old Dominion University,
USA

Stand-Alone Paper

*Engineering Undergraduate Students'
and Engineers' Career Choice and
Retention with Focus on the Gender
Aspect*

Yehudit Dori*, Technion—Israel Institute of
Technology, Israel
Hagit Refaeli-Mishkin, Technion—Israel
Institute of Technology, Israel
Niva Wengrowicz, Technion—Israel
Institute of Technology, Israel
Shahaf Rocker Yoel, Technion—Israel
Institute of Technology, Israel
Dov Dori, Technion—Israel Institute of
Technology, Israel

Mentor-Mentee Nexus

23-Mar-25, 6:00 PM-7:00 PM
Location: Annapolis 1

Social Event

**President's Welcome Reception &
Dance**

23-Mar-25, 7:00 PM-10:00 PM
Location: Woodrow Wilson Ballroom

Social Event

**In-Person Conference
24 March 2025**

RIG Business Meetings
24-Mar-25, 7:00 AM-8:00 AM

Latino/a RIG (LARIG) Business Meeting
Location: Annapolis 1

Contemporary Methods for Science Education Research Business Meeting
Location: Annapolis 2

Engineering Education RIG (ENE-RIG) Business Meeting
Location: Annapolis 3

Indigenous Science Knowledge Research Interest Group (ISK-RIG) Business Meeting
Location: Baltimore 1

Lesbian, Gay, Bisexual, Transgender, Queer, Plus Science Education Research Group (LGBTQ + RIG) Business Meeting
Location: Baltimore 2

Research in Artificial Intelligence-Involved Science Education (RAISE) Business Meeting
Location: Baltimore 3

Asian and Pacific Islander Science Education Research (APISER) Business Meeting
Location: Baltimore 4

Continental and Diasporic Africa in Science Education RIG (CADASE) Business Meeting
Location: Baltimore 5

Mind and Sole Fun Run
24-Mar-25, 7:00 AM-8:00 AM
Location: Offsite

Social Event

Early Career Faculty Forum
24-Mar-25, 7:00 AM-8:00 AM
Location: Magnolia 1

Administrative Session
Organizers
Joi Merritt, James Madison University, USA
Harleen Singh, California State University Stanislaus, USA

Fostering Inquiry in Southern African Schools

24-Mar-25, 8:15 AM-9:45 AM

Location: Camellia 1

Administrative Session

Organizers

Umesh Ramnarain, University of Johannesburg, South Africa

Joseph Krajcik, Michigan State University, East Lansing, USA

Panelists

Tebogo Moloi, University of Johannesburg, South Africa

Sechaba Koma, National University of Lesotho, Roma, Lesotho

Lereko Mohafa, National University of Lesotho, Roma, Lesotho

Katlego Leshabane, University of Johannesburg, South Africa

Nolutuando Mdlalose, University of Johannesburg, South Africa

Mafor Penn, University of Johannesburg, South Africa

Graduate Student Research Symposium

24-Mar-25, 8:15 AM-9:45 AM

Location: Cherry Blossom Ballroom

Administrative Session

Organizers

Savannah Graham Hayes, Space Center Houston, USA

Johan Tabora, University of Illinois at Chicago, USA

Mutiara Syifa, The Ohio State University, USA

Austin Jenkins, Purdue University, USA

Andrea Reeder, Middle Tennessee State University, USA

Brandin Conrath, Pennsylvania State University, USA

Alyssa Freeman, Middle Tennessee State University, USA

Sierra Morandi, Florida State University, USA

Cathy Culicott, Arizona State University, USA

Allison Metcalf, Florida State University, USA

Research in Artificial Intelligence-involved Science Education: RAISE RIG Poster Session

24-Mar-25, 8:15 AM-9:45 AM

Location: Annapolis 2

Administrative Session

Organizers

Xiaoming Zhai, University of Georgia, USA

Kent Crippen, University of Florida, USA

Presenters

Van Hoang Ngo, Taiwan Normal University, Taiwan

John Lin, Taiwan Normal University, Taiwan

Chun-Yen Chang, Taiwan Normal University, Taiwan

Shuchen Guo, Nanjing Normal University, USA

Ehsan Latif, University of Georgia, USA

Jinnie Shin, University of Florida, USA

Richard Lamb, University of Georgia, USA

Gyeong-Geon Lee, National Institute of Education, Singapore

Making sense of the microcosm:

Perspectives of educators and learners on immunobiology
Strand 1: Science Learning: Development of student understanding
24-Mar-25, 8:15 AM-9:45 AM
Location: Azalea 3

Related Paper Set

US childrens understanding of viral transmission
David Menendez*, University of California Santa Cruz, USA
Tania Dhaliwal, University of Chicago, USA
Danielle Labotka, University of michigan, USA
Susan Gelman, University of michigan, USA

Related Paper Set

Multilingual Students Use of Metaphors in the Context of Immunological Processes
Ronja Sowinski*, Leuphana University Lueneburg, Germany
Elisabeth Hofer, Leuphana University Lueneburg, Germany
Simone Abels, Leuphana University Lueneburg, Germany

Related Paper Set

Evil witches invading your house: How pre-service teachers use metaphors and anthropomorphisms to explain immunobiology
Isabell Adler*, Teacher University Bern, Switzerland
Jakub Sowula, Teacher University Bern, Switzerland
Trix Cacchione, University of Applied Sciences and Arts Northwestern Switzerland, Switzerland
Sebastian Tempelmann, Teacher University Bern, Switzerland

Related Paper Set

Children's Questions and Teacher's Responses about COVID-19 in Türkiye and the US
David Menendez, University of California, Santa Cruz, USA
Ronja Sowinski, Leuphana University of Lüneburg, Germany
Isabell Adler, University of Teacher Education Bern, Switzerland
Anna-Clara Rönner, University West, Sweden
Graciela Trujillo Hernandez*, University of Rochester, USA

Related Paper Set

Teaching infectious diseases at middle schools during and in the aftermath of the COVID-19 pandemic
Anna-Clara Roenner, Department of Environmental and Life Sciences, Sweden
Anna Jakobsson, Department of Educational Sciences, Individual and Society, Sweden
Niklas Gericke*, Department of Environmental and Life Sciences, Sweden

Enhancing Science Teacher

Knowledge and Practices

Strand 10: Curriculum and Assessment
24-Mar-25, 8:15 AM-9:45 AM
Location: Magnolia 1

Stand-Alone Paper

The Challenge of Competence in Primary and Lower Secondary Science Education – examples from Denmark
Jørgen Christiansen*, Department of Science Education, University of Copenhagen, Denmark

Stand-Alone Paper

Exploring Chemistry Teachers' Professional Knowledge and Noticing Through the Experience in a Chemistry-based Escape Room

Abir Saleh*, Technion – Israel Institute of Technology, Israel

Shirly Avargil, Technion – Israel Institute of Technology, Israel

Stand-Alone Paper

Intellectual humility and other content transcendent goals for science education

Jonathan Osborne*, Stanford University, USA

Daniel Pimentel*, University of Alabama, USA

Stand-Alone Paper

Examining Students' Scientific Inquiry Patterns Using Sequential Process Data

Yizhu Gao*, University of Georgia, USA

Xiaoming Zhai, University of Georgia, USA

Hee-Sun Lee, The Concord Consortium, USA

Stand-Alone Paper

A Mixed-Methods Investigation of Elementary/Middle School Science Teachers' Curriculum Use and Perceptions of Effectiveness

Tina Vo*, University of Nevada, Las Vegas, USA

Mayra Marquez-Mendez, University of Nevada, Las Vegas, USA

Adjoa Mensah, University of Nevada, Las Vegas, USA

Considering Context: Space and Place in Engineering Education

Strand 11: Cultural, Social, and Gender Issues

24-Mar-25, 8:15 AM-9:45 AM

Location: Azalea 1

Related Paper Set

Community-Based Engineering Learning in Familiar Contexts: Learning and Engineering Design Supported by Long-Term Relationships

Monica Cardella*, Florida International University, USA

Related Paper Set

Enacting Critical Science and Engineering Agency in a Community Focused Climate-Tech Journalism Project

Fatima Rahman*, Tufts University, USA

Kristen Wendell, Tufts University, USA

Chelsea Andrews, Tufts University, USA

Clara Mabour, Tufts University, USA

Greses Pérez, Tufts University, USA

Related Paper Set

Principles for Designing Culturally Sustaining Hip Hop STEM-rich Learning Spaces

Brian Gravel*, Tufts University, USA

Dionne Champion, TERC, USA

Eli Tucker-Raymond, Boston University, USA

Amon Millner, Olin College of Engineering, USA

Christopher Wright, Drexel University, USA

Ayana Allen-Handy, Drexel University, USA

Clara Mabour, Tufts University, USA

Related Paper Set

The Zone of Transition: Language as mediator of Space and Place in Engineering Education
Greses Perez, Tufts University, USA
G.R. Marvez, Tufts University, USA
Clara Mabour, Tufts University, USA
Ymbar Polanco Pino, Tufts University, USA

Innovative STEM Instruction

Strand 12: Technology for Teaching, Learning, and Research
24-Mar-25, 8:15 AM-9:45 AM
Location: Baltimore 5

Stand-Alone Paper

In-Field and Out-of-Field Teachers' Integration of a MOOC into their Instruction
Asnat Zohar*, Technion - Israel Institute of Technology, Israel
Shulamit Kapon, Technion - Israel Institute of Technology, Israel

Stand-Alone Paper

Lessons Learned from a Research-Practice Partnership to Integrate Agent-based Modeling into High School Science Classrooms
Aditi Wagh*, Massachusetts Institute of Technology, USA
Margaret Harrison, District of Columbia Public Schools, USA
Daniel Wendel, Massachusetts Institute of Technology, USA
Luke Conlin, Salem State University, USA
Emma Anderson, Massachusetts Institute of Technology, USA
Ilana Schoenfeld, Massachusetts Institute of Technology, USA

Stand-Alone Paper

The Effect Of Flipped Learning On Sixth Grade Students' Digital Literacy And Scientific Epistemological Beliefs
Feride Gökdaş*, Muğla Sıtkı Koçman University, Turkey
Aylin Çam, Muğla Sıtkı Koçman University, Turkey

Stand-Alone Paper

Lesson planning with ChatGPT for inquiry-based biology education – A(I) roll of the dice?
Leroy Grossmann*, Freie Universitaet Berlin, Germany
Maren Koberstein-Schwarz, IPN – Leibniz Institute for Science and Mathematics Education, Germany
Moritz Krell, IPN – Leibniz Institute for Science and Mathematics Education, Germany
Dirk Krueger, Freie Universitaet Berlin, Germany

Nature of Science and Socioscientific Issues in Biology and Undergraduate Settings

Strand 13: History, Philosophy, Sociology, and Nature of Science
24-Mar-25, 8:15 AM-9:45 AM
Location: Baltimore 2

Stand-Alone Paper

Reflections of Pre-Service Biology Teachers on the Nature of Science – What Does It Entail?
Sophie Kurschildgen*, Justus Liebig University, Germany
Alexander Büsing, Technische Universität Braunschweig/ Institute for Science Education, Germany

Stefan Schwarzer, University of Tübingen,
Germany
Kerstin Kremer, Justus Liebig University,
Germany

Stand-Alone Paper

On the construction and relation of science and sustainability in biology lessons

Charlotte Wolff*, University of Kassel,
Germany

Helge Martens, University of Kassel,
Germany

Stand-Alone Paper

Factors Associated with University Biology Students' Evolution Acceptance of and Emotive

Receptivity Toward Learning Evolution

Benjamin Herman*, Texas A&M University,

USA

Daniel DeJesus, Texas A&M University,
USA

Aaron Kidd, University of Oklahoma, USA

Benjamin Janney, University of Utah, USA

Magda Villwock, Texas A&M University,
USA

Carlos Perez, Texas A&M University, USA

Sarah Poor, University of Missouri, USA

Michael Clough, Texas A&M University,
USA

Asha Rao, Texas A&M University, USA

Stand-Alone Paper

Explorying Factors Associated with Undergraduate Students' Engagement with Socioscientific Issues Mis/disinformation

Sarah Poor*, University of Missouri, USA

Benjamin Herman, Texas A&M University,
USA

Climate Literacy 1

Strand 14: Environmental Education and Sustainability

24-Mar-25, 8:15 AM-9:45 AM

Location: Baltimore 3

Stand-Alone Paper

The Dark Corners of Southern Taiwan: An Investigation into the Ecological Identity and Littering Behavior

Jhu-Chun Yang*, Institute of Education,
National Sun Yat-sen University,, Taiwan

Paichi Pat Shein, Institute of Education,
National Sun Yat-sen University,, Taiwan

Stand-Alone Paper

Development and Validation of an Ecoliteracy Assessment Tool for Adolescents

Yingzhi Zhang, Capital Normal University,
China

Zhan Shi, Capital Normal University, China

Shuang Song, Capital Normal University,
China

Stand-Alone Paper

'There have always been hot days" – Analyzing high school students' argumentation from real-world climate data

Kay Burger*, Institut für Physik und
Technische Bildung, Germany

Engin Kardaş, Institut für Physik und
Technische Bildung, Germany

Tobias Ludwig, Institut für Physik und
Technische Bildung, Germany

Stand-Alone Paper

What motivates citizens to engage in different scientific activities of Citizen Science projects?

Till Bruckermann*, Leibniz University
Hannover, Germany

Denise Bock, IPN–Leibniz Institute for Science and Mathematics Education, Germany
Hannah Greving, Leibniz University Hannover, Germany
Anke Schumann, Leibniz Institute for Zoo and Wildlife Research, Germany
Milena Stillfried, Leibniz Institute for Zoo and Wildlife Research, Germany
Konstantin Börner, Leibniz Institute for Zoo and Wildlife Research, Germany
Robert Hagen, Landwirtschaftliches Zentrum Baden-Württemberg, Germany
Sophia Kimmig, Leibniz Institute of Freshwater Ecology and Inland Fisheries, Germany
Miriam Brandt, Leibniz Institute for Zoo and Wildlife Research, Germany
Ute Harms, IPN–Leibniz Institute for Science and Mathematics Education, Germany

Roundtables 1

24-Mar-25, 8:15 AM-9:45 AM

Location: Woodrow Wilson Ballroom

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Roundtable

Investigating inquiry-based learning in inclusive science education

Leonie Willmes*, University Duisburg-Essen, Germany

Helena van Vorst, University Duisburg-Essen, Germany

Mathias Ropohl, University Duisburg-Essen, Germany

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Roundtable

Evaluating Pedagogical Design Capacities for Differentiated Instruction in a digital environment. A case study.

Stephanie Bismuth*, Weizmann Institute of Science, Israel

Yael Shwartz, Weizmann Institute of Science, Israel

Anat Yarden, Weizmann Institute of Science, Israel

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Roundtable

The Impact of Students' Participation in Scientific Experiments on Scientific Achievements

Chaochao Jia*, China Research Institute for Science Popularization, China

Xiuj Li, China Research Institute for Science Popularization, China

Yu Qian, College of Physics and Optoelectronics Technology, Baoji University of Arts and Science, China

Tao Yang, Collaborative Innovation Center of Assessment for Basic Education Quality, Beijing Normal University, China

Yue Zhang, Institute on Educational Policy and Evaluation of International Students, Beijing Language and Culture University, China

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Roundtable

Inclusive science education:

Recognizing barriers and enabling participation via vignettes

Nathalie Beck*, University Duisburg-Essen, Germany

Mathias Ropohl, University Duisburg-Essen, Germany

Helena van Vorst, University Duisburg-Essen, Germany

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Roundtable

Education Needs Uncertainty: The Objective of Being in a Different Place

Leah Master*, NYU-Steinhardt, USA

Catherine Milne*, NYU-Steinhardt, USA

Anna Skorupa*, NYU-Steinhardt, USA

Shaghig Chaparian*, NYU-Steinhardt, USA

Kathryn Scantlebury, University of

Delaware, USA

Strand 5: College Science Teaching and Learning (Grades 13-20)

Roundtable

From Expectations to Reality: Female Students' Experiences and Struggles in Introductory Physics

Liliana Garcia*, University of California, Santa Barbara, USA

Strand 5: College Science Teaching and Learning (Grades 13-20)

Roundtable

Supporting first-generation college students in the sciences: An exploration of transformative teaching in higher education

Lisa Marco-Bujosa*, Villanova University, USA

Gracie Petrelli, Villanova University, USA

Strand 5: College Science Teaching and Learning (Grades 13-20)

Roundtable

Engaging Faculty in Professional Development to Support Revisions to a Non-Majors' Environmental Science Course

Hannah Jardine*, American University, USA

Barbara Balestra, American University, USA

Dhananjaya Katju, American University, USA

Alicia DeBruin, American University, USA

Carolyn Parker*, American University, USA

Strand 6: Science Learning in Informal Contexts

Roundtable

Development and Application of the Scripted Animation Survey (SAS) for Afterschool Professional Development

Heidi Cian*, Maine Mathematics and Science Alliance, USA

Strand 6: Science Learning in Informal Contexts

Roundtable

Supporting Learners Through Emotional Anchors in an AI and Paleontology Curriculum: A Social Constructivist Perspective

Nazanin Adhami*, University of Florida, USA

Tonika Jones, University of Florida, USA

Ray Opoku, University of Florida, USA

Gabriella Haire, University of Florida, USA

Christine Wusylko, University of Florida, USA

Chih Hsuan Lin*, University of Florida, USA

Bruce MacFadden, University of Florida, USA

Victor Perez, St. Mary's College of Maryland, USA

Brian Abramowitz, University of Florida, USA

Pavlo Antonenko, University of Florida, USA

Strand 6: Science Learning in Informal Contexts

Roundtable

Use of tactile prompts to increase memory of scientific experiences

Rhea Miles*, East Carolina University, USA

Strand 6: Science Learning in Informal Contexts

WIP Roundtable

Reception by primary-school pupils and parents of comic strips launching inquiries at home or school

Estelle Blanquet*, INSPE de l'académie de Bordeaux, France

Strand 8: In-service Science Teacher Education

Roundtable

Teacher Disposition and Professional Development Outcomes: A Case Study of Physics Teachers.

Justina Ogodo*, Baylor University, USA

Strand 8: In-service Science Teacher Education

Roundtable

K-12 Teacher Motivations to Attend Climate Change Professional Development

Amber Meeks*, North Carolina State University, USA

M. Gail Jones*, North Carolina State University, USA

Rebecca Ward, North Carolina State University, USA

Kathleen Bordewieck, North Carolina State University, USA

Tanzimul Ferdous, North Carolina State University, USA

Madeline Stallard, North Carolina State University, USA

Strand 8: In-service Science Teacher Education

Roundtable

Implementing Phenomenon-Based Instruction in Secondary Science Classrooms: A Case Study of Science Teachers' Approaches

Ezgi Yesilyurt*, Weber State University, USA

Jennifer Claesgens, California State University, East Bay, USA

Strand 8: In-service Science Teacher Education

Roundtable

A Participatory Professional Development Workshop: Exploring Middle School Students and Teachers Reflections

Michael Cassidy, TERC, USA

Debra Bernstein, TERC, USA

Gillian Puttick, TERC, USA

Santiago Gasca, TERC, USA

Strand 8: In-service Science Teacher Education

Roundtable

Computational Classrooms: A Constructivist, Research-Based Approach to Designing a Computer Science Course for Teachers

Jonathan Rivera*, University of Maryland, USA

Jennifer Radoff, University of Maryland, USA

Strand 8: In-service Science Teacher Education

WIP Roundtable

'You're Scientists Because You're Doing Research': How Teachers Take Up Doing "Authentic" Science With Students

Megan Walser*, Michigan State University,
USA

David Stroupe*, University of Utah, USA

Strand 11: Cultural, Social, and Gender Issues Roundtable

TRANSforming language use in science education through trans and queer studies

Ayça Fackler*, University of Missouri, USA

Gary Wright*, University of Missouri, USA

Strand 11: Cultural, Social, and Gender Issues

Roundtable

Embodied Inquiry: Intersecting Queer/Trans Self-Determination with the Nature of Science

K. "Ren" Mendoza*, University of Nebraska at Omaha, USA

Khanh Tran*, Purdue University, USA

Strand 11: Cultural, Social, and Gender Issues

Roundtable

Navigating the Margins: Self-Advocacy, Mentorship, and Institutional Barriers in the Careers of Nonbinary STEM Faculty

Ezra Kottler*, University of the Pacific, USA

K. "Ren" Mendoza*, University of Nebraska at Omaha, USA

Adrian Gentry, Purdue University, USA

Emily Haluschak*, Purdue University, USA

Strand 10: Curriculum and Assessment WIP Roundtable

Centering Student Voice to Engage a Teacher's Critical Noticing to

(w)Holistically Assess Student Thinking

Terrance Burgess, Michigan State University, USA

Strand 10: Curriculum and Assessment

WIP Roundtable

Exploring Core Ideas: A Systematic Literature Review of Core Ideas in Science Education

Helen Semilarski*, University of Tartu, Estonia

Helin Semilarski, University of Tartu, Estonia

Strand 10: Curriculum and Assessment

WIP Roundtable

Designing research-based STEM frameworks for student-focused holistic aquatic robotics kits (SHARK) for children and adolescents

Zoubeida Dagher*, University of Delaware, USA

Jennifer Gallo-Fox, University of Delaware, USA

Maisha Mouli, University of Delaware, USA

Faezeh Vahdat-Nia, University of Delaware, USA

Tyler Van Buren, University of Delaware, USA

WIP Roundtable

Fidelity of Implementation to Three-Dimensional Critical Components: A Systematic Review

Lauren Browning*, George Washington University, USA

Strand 14: Environmental Education and Sustainability

Roundtable

Problem-Based Learning in a Non-Majors Environmental Science Class. Is it Science?

Carolyn Parker*, American University, USA

Nicole LeVee, American University, USA

Hannah Jardine, American University, USA

Alicia Debruin, American University, USA

Strand 14: Environmental Education and Sustainability

WIP Roundtable

Basic Sciences as a Tool for Environmental Awareness: School Education on Single-Use Plastics

Narendra Deshmukh, Tata Institute of Fundamental Research, India

Pavithra Priyadarshini Selvakumar, Oklahoma State University, USA

Strand 14: Environmental Education and Sustainability

WIP Roundtable

Assessing students' knowledge in the field of green chemistry

Laura Freude*, University of Duisburg-Essen, Germany

Mathias Ropohl, University of Duisburg-Essen, Germany

Strand 14: Environmental Education and Sustainability

WIP Roundtable

Systems thinking in chemistry education – modeling and test development

Silja Herholz*, University of Duisburg-Essen, Germany

Mathias Ropohl, University of Duisburg-Essen, Germany

Developing Scientific Attitudes and Identities

Strand 2: Science Learning: Contexts, Characteristics and Interactions

24-Mar-25, 8:15 AM-9:45 AM

Location: Annapolis 1

Stand-Alone Paper

Middle School Science Interest: Elementary School Science Experiences and Middle School

Science and Mathematics Grades

Katherine Dabney*, Virginia

Commonwealth University, USA

Gerhard Sonnert, Harvard, USA

Susan Sunbury, Harvard, USA

Philip Sadler, Harvard, USA

Stand-Alone Paper

Bridging the Attitude Gap: Trust in Science vs. Learning Science

Adi Moskovits*, Weizmann Institute of Science, Israel

David Fortus, Weizmann Institute of Science, Israel

Stand-Alone Paper

Reducing Chemophobia and Improving Chemistry Learning through an Amalgam of Culture-Technology-Context-and-Humor

Adekunle Oladejo, Lagos State University (LASU-ACEITSE), Nigeria

Peter Okebukola, Lagos State University (LASU-ACEITSE), Nigeria

Rasheed Sanni, Lagos State University (LASU-ACEITSE), Nigeria

Taibat Olateju, Obafemi Awolowo University, Nigeria

Franklin Onowugbeda, Lagos State University (LASU-ACEITSE), Nigeria

Deborah Agbanimu, National Open University of Nigeria (NOUN), Nigeria

Olasunkanmi Gbeleyi, Lagos State University (LASU-ACEITSE), Nigeria
Ademola Ibukunolu, Lagos State University (LASU-ACEITSE), Nigeria
Esther Peter, Lagos State University (LASU-ACEITSE), Nigeria

Stand-Alone Paper

Examining Science Identity Shifts: The Role of Peer and Teacher Positioning in Classroom Interactions

Wenya Yang, Ruixiang Experimental School, China

Weiwei He*, Michigan State University, USA

Huixian Wu, Institute of Problem-Systematized-Learning, China

Examining science teacher identity, beliefs, and transformative practices to improve educational outcomes

Strand 4: Science Teaching — Middle and High School (Grades 5-12): Characteristics and Strategies

24-Mar-25, 8:15 AM-9:45 AM

Location: Baltimore 4

Stand-Alone Paper

Science Teacher Identity Among National Board-Certified Science Teachers

Jennifer Tripp*, University at Buffalo, SUNY, USA

Xiufeng Liu, University at Buffalo, SUNY, USA

Stand-Alone Paper

Exploring science teachers' beliefs and practice patterns: a latent profile analysis

Zhao Cao Kan*, East China Normal University, China

Aik-Ling Tan, National Institute of Education, Nanyang Technological University, Singapore
Xinning Pei, East China Normal University, China

Stand-Alone Paper

Raciolinguistic ideologies and formative assessment among middle and high school science teachers: A preregistered replication

Quentin Sedlacek*, Southern Methodist University, USA

Maricela León, Southern Methodist University, USA

Nickolaus Ortiz, Georgia State University, USA

Catherine Lemmi, California State University Chico, USA

Kimberly Feldman, Southwest Academy, Baltimore County Public Schools, USA

Critical Thinking and Argumentation in STEM

Strand 5: College Science Teaching and Learning (Grades 13-20)

24-Mar-25, 8:15 AM-9:45 AM

Location: Magnolia 3

Stand-Alone Paper

Using Model Evidence Link Diagram to Assess College Students' Plausibility Perceptions on Climate Change

Gizem Ozyazici*, Syracuse University, USA

Gaye Ceyhan, Bogazici University, Turkey

Stand-Alone Paper

University Students Perceptions of a Newly Designed Instructional Framework for Promoting Critical Thinking

Carmella Shahab*, Technion - Israel Institute of Technology, Israel
Miri Barak, Technion - Israel Institute of Technology, Israel

Stand-Alone Paper

Assessing Student Scientific Argumentation Using Natural Language Processing
Winter Allen*, Department of Physics and Astronomy, Purdue University, USA
Carina Rebello, Department of Physics, Toronto Metropolitan University, Canada
N. Sanjay Rebello, Department of Physics and Astronomy, Purdue University, USA

Stand-Alone Paper

Designing Issue-based Instruction in General Education Course to Influence Undergraduates' Argumentation Performances and Learning Interest
Shih-Yeh Chen*, National Taichung University of Education, Taiwan
Shiang-Yao Liu, National Taiwan Normal University, Taiwan

Engaging High School Students through Research and Outreach Experiences

Strand 6: Science Learning in Informal Contexts
24-Mar-25, 8:15 AM-9:45 AM
Location: Magnolia 2

Stand-Alone Paper

A Qualitative Analysis of High School Students' Reflections Before and After a University Field Trip
Toluwalase Salako*, North Carolina State University, USA
Tyler Harper-Gampp, North Carolina State University, USA

Margaret Blanchard, North Carolina State University, USA

Stand-Alone Paper

Measuring High School Student Knowledge of Quantum Information Science and Technology in University-Based Outreach
Robert De La Cruz, Stony Brook University, USA
Angela Kelly, Stony Brook University, USA
Tzu-Chieh Wei, Stony Brook University, USA
Dominik Schneble, Stony Brook University, USA
Michele Darienzo, Stony Brook University, USA

Stand-Alone Paper

URM HIGH SCHOOL STUDENTS EXPERIENCES WITH AUTHENTIC RESEARCH CONDUCTED AT A UNIVERSITY CAMPUS
Maram Alaqla*, Sharjah Education Academy, UAE
Bugrahan Yalvac, Texas A&M University, USA

Stand-Alone Paper

Questioning to Facilitate Dialogues between Scientists and High School Students in A Science Internship
Pei-Ling Hsu*, University of Texas at El Paso, USA
Erica Nash*, University of Texas at El Paso, USA

Computational Thinking in STEM

Teaching and Learning

Strand 7: Pre-service Science Teacher Education

24-Mar-25, 8:15 AM-9:45 AM

Location: Baltimore 1

Stand-Alone Paper

Pre-Service Teachers' Reasoning about the Nervous System

Ihsan Ghazal*, Boston University, USA

Hayat Hokayem, Texas Christian University, USA

Stand-Alone Paper

Challenging Misconceptions: Leveraging Cognitive Conflict to Enhance Pre-service Science Teachers' Understanding

Jingyun Wu*, Indiana University, USA

Adam Maltese, Indiana University, USA

Gholamreza Shamsi Pour Siahmazgi, Indiana University, USA

Arya Karumanthra, Indiana University, USA

Stand-Alone Paper

Empowering Science Pre-service Teachers: Computational Thinking Preparation through SPARC-infused instruction

Jianlan Wang*, Texas Tech University, USA

Yuanlin Zhang, Texas Tech University, USA

Stand-Alone Paper

Investigating Preservice Teachers' (PSTs') Conceptions of "Plugged" and "Unplugged" Computational Thinking (CT) via Integrated Robotics

Jeffrey Radloff*, SUNY Cortland, USA

Bridget Miller*, University of South Carolina, USA

Qwynne Lackey, SUNY Cortland, USA

Transformative Professional Development for Equitable STEM Education

Strand 8: In-service Science Teacher Education

24-Mar-25, 8:15 AM-9:45 AM

Location: Annapolis 3

Stand-Alone Paper

STEM Learning Trajectories of In-service Teachers

Tasneem Anwar, Aga Khan University, Pakistan

Dania Usman, Aga Khan University, Pakistan

Stand-Alone Paper

Shifts in middle school STEM teachers' conceptions of teacher leadership and equity

Matthew Wilsey*, University of Notre Dame, USA

Michael Szopiak, University of Notre Dame, USA

D'Anna Pynes, University of Notre Dame, USA

Catherine Wagner, University of Notre Dame, USA

Matthew Kloser*, University of Notre Dame, USA

Gina Svarovsky, University of Notre Dame, USA

Stand-Alone Paper

Middle-School STEM Teachers' Collaborative Sensemaking During a Curriculum Planning Workshop

Kristen Wendell*, Tufts University, USA

Geling Xu, Tufts University, USA

Debra Bernstein, TERC, USA

Michael Cassidy, TERC, USA

William Church, CRCS, USA

Ethan Danahy, Tufts University, USA

Stand-Alone Paper

*(Un)Becoming-STEMM Educator-With
Justice-Oriented Professional*

Development Workshops

Katherine Ayers*, St. Jude Children's
Research Hospital, USA

Robyn Pennella, St. Jude Children's
Research Hospital, USA

Olayinka Mohorn-Mintah, University of
Memphis, USA

Stand-Alone Paper

*Extending your Professional
Development: Exploring Virtual PLCs
as an opportunity for continued
teacher support.*

Austin Moore*, Boston College, USA

Maria Moreno Vera, Boston College, USA

Katherine McNeill, Boston College, USA

**National Academies of Sciences,
Engineering, and Medicine**

Consensus Study: Equity in K-12

24-Mar-25, 10:00 AM-11:30 AM

Location: Azalea 2

Symposium

Organizers

Kenne Dibner, NASEM Board on Science
Education, Washington, DC, USA

Leticia Garcilazo Green, NASEM Board on
Science Education, Washington, DC, USA

Eileen Parsons, University of North
Carolina at Chapel Hill, USA

Panelists

Kenne Dibner, NASEM Board on Science
Education, Washington, DC, USA

Eileen Parsons, University of North
Carolina at Chapel Hill, USA

Stefanie Marshall, Michigan State
University, East Lansing, USA

**Bridging Theory and Practice:
Modeling, Mathematization, and
Student Development**

**Strand 1: Science Learning: Development
of student understanding**

24-Mar-25, 10:00 AM-11:30 AM

Location: Azalea 3

Stand-Alone Paper

*Bridging Equations and Phenomena:
Task Design's Role in Promoting
Blended Sensemaking*

Desi Desi, Sriwijaya University, Indonesia

Anita Schuchardt*, University of
Minnesota, USA

Stand-Alone Paper

*Evaluating Students' Development of
Systems Thinking via Computational
System Modeling*

Emil Eidin*, University of Wyoming, USA

Jonathan Bowers, Michigan State
University, USA

Mark Perkins, University of Wyoming, USA

Stand-Alone Paper

*Challenges of Modeling Life Cycles for
Lebanese Elementary Students*

Christelle Fayad*, Texas Christian
University, USA

Hayat Hokayem*, Texas Christian
University, USA

Stand-Alone Paper

*Leveraging Mathematization Process
to Enhance Automated Scoring of
Learning Progression Based Items*

Hui Jin*, Georgia Southern University, USA

Cynthia Lima, University of Texas at San Antonio, USA

Investigating Strategies for Fostering Social-Emotional Growth in STEM
Strand 2: Science Learning: Contexts, Characteristics and Interactions
24-Mar-25, 10:00 AM-11:30 AM
Location: Annapolis 1

Stand-Alone Paper

Differentiated instruction as a method to influence cognitive and affective learning outcomes in chemistry education

Anna Liskes*, University of Duisburg-Essen, Germany

Helena van Vorst, University of Duisburg-Essen, Germany

Stand-Alone Paper

A Framework for Examining the Interconnectedness of STEM and SEL

Cory Susanne Miller*, Michigan State University, USA

Kathryn Bateman*, Museum of Science, USA

Stand-Alone Paper

Facilitating productive affective transitions during a physics inquiry

Lulu Garah*, Technion - Israel Institute of Technology, Israel

Shulamit Kapon, Technion - Israel Institute of Technology, Israel

Enhancing strategies for boosting elementary student scientific literacy

Strand 3: Science Teaching — Primary School (Grades preK-6): Characteristics and Strategies

24-Mar-25, 10:00 AM-11:30 AM

Location: Camellia 1

Stand-Alone Paper

The Impact of Organizing and Addressing STEM-practices in a STEM-circle in 2ndgrade STEM leaning environments

Kara-Sophie Köhler*, University of Hamburg, Germany

Karl Wollmann, University of Leipzig, Germany

Annett Steinmann, University of Leipzig, Germany

Kim Lange-Schubert, University of Leipzig, Germany

Maike Hagenau,Leibniz University of Hannover, Germany

Marcus Schütte, University of Hamburg, Germany

Mirjam Steffensky, University of Hamburg, Germany

Stand-Alone Paper

Understanding Discrepancies in Science Identity by Gender and Grade among Chinese Students

Bing Feng, Beijing Normal University, China

Yangdan Liu, Beijing Normal University, China

Jing Lin*, Beijing Normal University, China

Stand-Alone Paper

The Impact of Engineering DesignBased Instruction on Urban Elementary Students Nature of Engineering Views

Emine Sahin Topalcengiz*, Mus Alparslan University, Turkey

Stand-Alone Paper

Investigating Mechanistic Reasoning in Modeling-Based Learning in Kindergarten Science: The case of Melting And Freezing
Loucas Louca*, European University Cyprus, Cyprus
Maro Michaelidou, Ministry of Education and Culture, Cyprus

Yu-Jan Tseng*, Institute of Professional Development for Educators, National Chung Hsing University, Taiwan
Huann-shyang Lin, Centre for General Education, National Sun Yat-sen University, Taiwan

Stand-Alone Paper

Enhancing Self-Regulated Problem Solving Through a Web-based Metacognitive Tool
Leonie Jasper*, TU Dortmund University, Germany
Insa Melle, TU Dortmund University, Germany

NARST Connects

24-Mar-25, 10:00 AM-11:30 AM
Location: Camellia 2

Discussion Session

This is a time for conference attendees to connect and discuss professionally related topics of their choosing. There are no designated presenters or moderators. Participants are expected to adhere to the NARST Program Code of Conduct.

Examining the transformative potential of systems thinking, technology, and teacher agency in modern education

Strand 4: Science Teaching — Middle and High School (Grades 5-12): Characteristics and Strategies

24-Mar-25, 10:00 AM-11:30 AM
Location: Baltimore 4

Stand-Alone Paper

Improving high school student's scientific competencies through systems thinking inquiry

Stand-Alone Paper

The Alchemy of Teacher-Driven Adaptations in the Age of Digital Curricula
Brandin Conrath, Virginia Commonwealth University, USA
Scott McDonald, The Pennsylvania State University, USA

Stand-Alone Paper

Insights into Co-designing Teaching NGSS-aligned Computational Agent-based Modeling Units in High School Science Classrooms
Elroy Murray*, DCPS, USA
Aditi Wagh, MIT, USA
Luke Conlin, Salem State University, USA

Epistemic Practices, Beliefs, and Agency in STEM

Strand 5: College Science Teaching and Learning (Grades 13-20)

24-Mar-25, 10:00 AM-11:30 AM

Location: Magnolia 3

Stand-Alone Paper

Exploring effective strategies of developing student systems thinking and epistemic beliefs about science

Huann-shyang Lin*, National Sun Yat-sen University, Taiwan

Zuway-R Hong, Chung Shan Medical University, Taiwan

Hsin-Hui Wang, National Tsing Hua University, Taiwan

Ming-Yeng Lin, National Cheng Kung University, Taiwan

Stand-Alone Paper

EPIC-Quest: Characterizing Epistemic Messages in Chemistry Lectures

Nicole Graulich*, Justus-Liebig University Giessen, Institute of Chemistry Education, Germany

Elias Heinrich, Justus-Liebig University Giessen, Institute of Chemistry Education, Germany

Stand-Alone Paper

Scientific Writing in English in Higher Education and Non-Anglophone Students' Participation in Epistemic Practices

Luciana Milena*, Universidade Federal do ABC, Brazil

Danusa Munford, Universidade Federal do ABC, Brazil

Stand-Alone Paper

Biological reasoning and epistemic agency: A case of undergraduate biology teaching and learning

Greta Etherton*, University of Maryland, USA

Daniel Levin*, University of Maryland, USA

Julia Gouvea*, Tufts University, USA

Centering Equity, Agency, and Diverse Epistemologies in Informal STEM Education

Strand 6: Science Learning in Informal Contexts

24-Mar-25, 10:00 AM-11:30 AM

Location: Magnolia 2

Stand-Alone Paper

Negotiating Power: Minoritized youth instructors' enactments of critical agency in outreach activities in their community

Wisal Ganaiem*, Technion - Israel Institute of Technology, Israel

Fadia Nasser-Abu-Alhija, Tel Aviv University, Israel

Shulamit Kapon, Technion - Israel Institute of Technology, Israel

Stand-Alone Paper

STEM Outreach as Academic Imperialism: A Critical Discourse Analysis

george schafer*, Drexel University, USA

Understanding Preservice Teachers' Teaching and Learning practices
Strand 7: Pre-service Science Teacher Education
24-Mar-25, 10:00 AM-11:30 AM
Location: Baltimore 1

Stand-Alone Paper

Understanding Stress and Coping Strategies of Pre-Service Science Teachers in a Teacher Preparation Program

Anne Levendusky*, University of Florida, USA
Kent Crippen, University of Florida, USA

Stand-Alone Paper

Battling the Clock: P-2nd Clinical Educator Dilemmas Regarding Time for Science

Jennifer Gallo-Fox, University of Delaware, USA
Sothera Veng, University of Delaware, USA
Rosa Mykta-Chomsky*, University of Delaware, USA

Stand-Alone Paper

Personal Characteristics Impacting Teachers' Effective Argumentation Teaching in science classrooms: A Literature Review

Nannan Fan*, University of north carolina at chapel hill, USA

Stand-Alone Paper

Reimagining Science Education: A Culturally Sustaining, Health-Centric Approach Addressing Type 2 Diabetes

Miriam Ortiz, University of Texas Rio Grande Valley, USA
Angela Chapman*, University of Texas Rio Grande Valley, USA

Research Experiences for Teachers (RETs) Through the Lens of Rightful Presence
Strand 8: In-service Science Teacher Education
24-Mar-25, 10:00 AM-11:30 AM
Location: Annapolis 3

Related Paper Set

Science teachers in research experiences: Learning from 25 years of RETs to inform future programs

Karen Woodruff*, Kean University, USA
Suzanne Patzelt*, Touro University, USA

Related Paper Set

Understanding Science Science Teaching as Political Domains: RET Teachers Enactment of Justice-Centered Pedagogies

Shannon Davidson*, University of Alabama, USA
Roxanne Hughes, Florida State University, USA
Stacey Hardin, University of Washington, USA

Related Paper Set

Exploring Power Dynamics in Teacher Research Experiences: Insights from bacteriophage discovery in K-12 classrooms

Chris Pavlovich*, Montana Technological University, USA
Rayelynn Brandl, Montana Technological University, USA
Marisa Pedulla, Montana Technological University, USA

Related Paper Set

Developing Dispositions for Indigenous Science and Engineering Knowledge in Elementary Science Teachers through a RET

Linda Rost, Baker High School, USA
Rebecca Hite*, Texas Tech University, USA
Gina Childers*, Texas Tech University, USA
Sweeney Windchief, Montana State University, USA

Biological Phenomena and Their Roles in Designing and Evaluating Assessments of Student Understanding and Learning
Strand 10: Curriculum and Assessment
24-Mar-25, 10:00 AM-11:30 AM
Location: Magnolia 1

Related Paper Set

Characterizing the diversity of evolutionary phenomena in curricula and their relationships to causal-mechanistic explanations

Evan Abreu*, Stony Brook University, USA
Ross Nehm, Stony Brook University, USA

Related Paper Set

The structure and magnitude of novice evolutionary knowledge across phenomena using the CANS instrument

Gena Sbeglia*, San Diego State University, USA
Austin Zuckerman, University of California - San Diego, USA

Related Paper Set

Assessing student reasoning about matter and energy across biological phenomena using the MOMO

Austin Zuckerman*, San Diego State University, USA
Gena Sbeglia, San Diego State University, USA
Ross Nehm, Stony Brook University, USA

Related Paper Set

Evaluating undergraduate student's Perceptions of the Magnitude of Variation (PMoV) across biological phenomena

Cecylia Quintero*, San Diego State University, USA
Gena Sbeglia, San Diego State University, USA

Navigating Identity and Resilience in STEM Higher Education

Strand 11: Cultural, Social, and Gender Issues
24-Mar-25, 10:00 AM-11:30 AM
Location: Azalea 1

Stand-Alone Paper

Community college transfer students' navigations of boundary experiences through a storied science identity lens

Paul Le*, University of Colorado Denver, USA
Sarah Hug, Colorado Evaluation and Research Consulting, USA
Laurel Hartley, University of Colorado Denver, USA

Stand-Alone Paper

The Role of Socialized Assumptions in Shaping Identities of Women in Mathematically Intensive STEM Majors

Terrie Galanti*, University of North Florida, USA
Nancy Holincheck*, George Mason University, USA
Tiffany Butler*, George Mason University, USA

Stand-Alone Paper

Understanding Differences in Perceived Viability by Physicists in Careers for Academia, Government and Private Industry

Daniel Oleynik*, University of Central Florida, USA

Erin Scanlon, University of Connecticut - Avery Point, USA

Constance Doty, University of Central Florida, USA

Jacquelyn Chini, Ohio State University, USA

Stand-Alone Paper

Graduate Student Resilience: Using Survey Analysis to Explore Influential Factors in U.S. Graduate Education

Karen Collier*, Augusta University, USA

Margaret Blanchard*, North Carolina State University, USA

Stand-Alone Paper

Identity Development of Scientists with (dis)Abilities

Jonathan Hall*, California State University, San Bernardino, USA

Mila Rosa Carden*, University of North Texas, USA

Sarah Losoya*, University of North Texas, USA

Powered decision-making for equity in science education: Beyond access and inclusion

Strand 11: Cultural, Social, and Gender Issues

24-Mar-25, 10:00 AM-11:30 AM

Location: Annapolis 2

Symposium

Powered decision-making for equity in science education: Beyond access and inclusion

Elizabeth Davis*, University of Michigan, USA

Sage Andersen, University of Texas, USA

Jessica Bautista, University of Michigan, USA

Terrance Burgess, Michigan State University, USA

Heidi Caralone, Vanderbilt University, USA

Symone Gyles, University of California, USA

Stefanie Marshall, Michigan State University, USA

Veronica McGowan, University of Washington, USA

Jordan Sherry-Wagner, University of Washington, USA

Michele Williams, University of Illinois, USA

Carrie Tzou, University of Washington, USA

Innovative Exploration in STEM Evaluation

Strand 12: Technology for Teaching, Learning, and Research

24-Mar-25, 10:00 AM-11:30 AM

Location: Baltimore 5

Stand-Alone Paper

Design and Usability Evaluation of an Innovative Educational App for Inquiry-Based Education

Iraya Yáñez-Pérez, University of Burgos, Spain

Radu Bogdan Toma*, University of Burgos, Spain

Stand-Alone Paper

Developing an instrument to explore junior high school students' online science capital

Wei-Shou Chen*, Graduate Institute of Information and Computer Education, National Taiwan Normal University, Taiwan

Chin-Chung Tsai, Program of Learning Sciences, National Taiwan Normal University, Taiwan

Min-Hsien Lee, Program of Learning Sciences, National Taiwan Normal University, Taiwan

Jyh-Chong Liang, Program of Learning Sciences, National Taiwan Normal University, Taiwan

Stand-Alone Paper

Enhancing Chemistry Learning by Providing Formative Feedback and Assessment in Interactive Digital Learning Units

Florian Trautem*, University of Duisburg-Essen, Germany

Carolin Eitemüller, University of Duisburg-Essen, Germany

Maik Walpuski, University of Duisburg-Essen, Germany

Stand-Alone Paper

Empowering students' digital literacy in the AI era through the creation of Innovation Centers

Zacharoula Smyrnaiou*, Computer Technology Institute and Press

"Diophantus", Greece

Eleni Georgakopoulou, National and Kapodistrian University of Athens, Greece

Martha Georgiou, National and Kapodistrian University of Athens, Greece

Teaching to Develop Competent Outsiders: Preparing Students to Engage With Socioscientific Issues in Daily Life

Strand 13: History, Philosophy, Sociology, and Nature of Science

24-Mar-25, 10:00 AM-11:30 AM

Location: Baltimore 2

Related Paper Set

Promoting Motivation for Environmentally Responsible Teaching of Science Practices in Pre-Service Elementary Teachers

Benjamin Janney*, University of Utah, USA
Lynne Zummo, University of Utah, USA

Related Paper Set

'Science is... communication across the board': A biology teacher's conceptions of science media literacy
Daniel Pimentel*, The University of Alabama, USA

Related Paper Set

Science civic engagement self-concept and experiential learning in an introductory college course

Jenny Dauer*, University of Nebraska-Lincoln, USA

Jennifer Teshera-Levy, University of Nebraska-Lincoln, USA

Lisa Corwin, University of Colorado Boulder, USA

Christine Haney-Douglass, University of Nebraska-Lincoln, USA

Related Paper Set

Preparing Undergraduate Students to Resist Socioscientific Issues Mis/disinformation Through Collaboration with University Scientists

Sarah Poor*, University of Missouri, USA
Benjamin Herman, Texas A&M University, USA
Tamara Powers, Texas A&M University, USA

Related Paper Set

How Science Teachers Negotiate Identities to Manage Disconnects Between Science Inside and Outside the Classroom

Sam Evans*, University of Wisconsin, USA

Climate Literacy 2

Strand 14: Environmental Education and Sustainability
24-Mar-25, 10:00 AM-11:30 AM
Location: Baltimore 3

Stand-Alone Paper

A Systematic Review of Intervention Studies on Climate Literacy in K-12 Science Classrooms
Ayça Fackler*, University of Missouri, USA
Madeline Good, University of Missouri, USA
Ricardo Rojas Calderon, University of Missouri, USA
Emily Adah Miller, University of Georgia, USA

Stand-Alone Paper

Towards a Unified Framework for Climate Change Literacy in Science Education: A Systematic Literature Review
Helin Semilarski*, University of Tartu, Estonia
Helen Semilarski, University of Tartu, Estonia

Stand-Alone Paper

Concerns, Methods, Grade Bands that Allow the Teaching of Ecoliteracy
Peter Oyewole*, Kent State University, USA

Awards Luncheon

24-Mar-25, 11:45 AM-1:15 PM
Location: Woodrow Wilson Ballroom

Social Event

"Through the Lens of Leadership: Charting NARST's Growth and Impact with the Work of Its Fellows"
24-Mar-25, 1:30 PM-3:00 PM
Location: Annapolis 4

Administrative Session

Organizer
Amelia Gotwals, Michigan State University, USA

Basu Scholars Symposium: Presentation of the 2024 Basu Scholars

24-Mar-25, 1:30 PM-3:00 PM
Location: Annapolis 2

Symposium

Organizers
Regina McCurdy, Georgia Southern University, Statesboro, USA
Marsha Simon, Valdosta State University, USA
Khanh Tran, Purdue University, USA
Ilana De La Cruz, Texas A & M University, USA

Carol Waters, University of Houston-Clear Lake, USA

Alexandrea Muller, University of California - Santa Barbara, USA

Cognitive Load and Mechanistic Reasoning: The Role of Errors and Black Box Explication in Learning

Strand 1: Science Learning: Development of student understanding

24-Mar-25, 1:30 PM-3:00 PM

Location: Azalea 3

Stand-Alone Paper

Highlighting errors is worth it! - Erroneous examples foster learning gains and cognitive load in chemistry

Sonja Dieterich*, University of Duisburg-Essen, Germany

Stefan Rumann, University of Duisburg-Essen, Germany

Marc Rodemer, University of Duisburg-Essen, Germany

Stand-Alone Paper

The effect of black boxes on understanding mechanistic information

Michal Haskel-Ittah*, Weizmann Institute of Science, Israel

Shanny Mishal-Morgenstern, Weizmann Institute of Science, Israel

Stand-Alone Paper

Into the Black: The Effect of Black Box Explication on Biology Students' Mechanistic Reasoning

Gur Livni Alcasid*, Weizmann Institute of Science, Israel

Michal Haskel-Ittah, Weizmann Institute of Science, Israel

Exploring In Situ Engagement and Decision-Making in Science Education

Strand 2: Science Learning: Contexts, Characteristics and Interactions

24-Mar-25, 1:30 PM-3:00 PM

Location: Annapolis 1

Stand-Alone Paper

Field Study Science Observations in K-12 Settings: An Investigation of Pedagogical Strategies

Steph Dean*, Clemson University, USA

Devan Jones*, Clemson University, USA

Stand-Alone Paper

Engagement development of junior high school students during the enactment of Grand Challenges units

Shira Passentin*, Weizmann Institute of Science, Israel

Troy Sadler, University of North Carolina at Chapel Hill, USA

David Fortus, Weizmann Institute of Science, Israel

Stand-Alone Paper

Unraveling the Association between Perceptions of Science Instructions and Student Engagement across Grades

Xin Xia*, University of Virginia, USA

Robert Tai, University of Virginia, USA

Stand-Alone Paper

Who Shapes Science?: Elementary Students' Bids for Emergent Authentic Science with a University Entomologist

Sinead Brien*, University of South Carolina Upstate, USA

David Stroupe*, University of Utah, USA

**Reforming STEM Education:
Culturally Responsive and Inclusive
Practices in Physics and Chemistry
Teaching**
**Strand 4: Science Teaching — Middle and
High School (Grades 5-12): Characteristics
and Strategies**
24-Mar-25, 1:30 PM-3:00 PM
Location: Baltimore 4

Related Paper Set

*Fostering Inclusivity: Transforming
Physics and Chemistry Curricula for
Diverse Classrooms*

Clausell Mathis*, Michigan State
University, USA

Joseph Krajick, Michigan State University,
USA

Ehud Aviran, Michigan State University,
USA

Ozlem Akcil Okan, Michigan State
University, USA

Lucky Nonyelum, Michigan State
University, USA

William Van Luven, Michigan State
University, USA

Angie Valbuena Rojas, Michigan State
University, USA

Barbara Schneider, Michigan State
University, USA

Related Paper Set

*Cultural Resources in Physics
Education: A Study of Culturally
Responsive Curriculum Development
among Secondary Teachers*

Ozlem Akcil Okan*, Michigan State
University, USA

Clausell Mathis*, Michigan State
University, USA

Lucky Nonyelum, Michigan State
University, USA

Related Paper Set

*Politicized Care Dimensions in Physics
Education: Pedagogical Practices and
Engagement Case Study for
Underserved Students.*

Clausell Mathis*, Michigan State
University, USA

Lama Jaber*, Florida State University, USA
Sherry Southerland*, Florida State
University, USA

Related Paper Set

*Perspectives of Critical Care of
Minoritized Students: One Teachers
Leveraging of Care for Science
Learning*

Sierra Morandi*, Florida State University,
USA

Sherry Southerland, Florida State
University, USA

**Taking a Critical Look at Graduate
Education in Physics**

**Strand 5: College Science Teaching and
Learning (Grades 13-20)**

24-Mar-25, 1:30 PM-3:00 PM

Location: Magnolia 3

Related Paper Set

*Investigating the Landscape of
Physics Graduate Program
Requirements*

Bill Bridges*, Kansas State University, USA

Daniel Sharkey, Ohio State University, USA

Jacquelyn Chini, Ohio State University,
USA

Rachel Henderson, Michigan State
University, USA

James Laverty, Kansas State University,
USA

Related Paper Set

Why they stay: Counternarratives of women PhD students in physics
R Strain, Auburn University, USA
Eric Burkholder*, Auburn University, USA

Related Paper Set

Study of a nontraditional physics doctoral student's program departure
Eric Burkholder*, Auburn University, USA
Steven Cortez, Auburn University, USA

Related Paper Set

A Change Agents' Experience Reforming Physics Candidacy Exams
Daniel Sharkey*, The Ohio State University, USA
Bill Bridges, Kansas State University, USA
James Laverty, Kansas State University, USA
Rachel Henderson, Michigan State University, USA
Jacquelyn Chini, The Ohio State University, USA

Building Reflective and Supportive Pathways in Preservice Teacher Education

Strand 7: Pre-service Science Teacher Education
24-Mar-25, 1:30 PM-3:00 PM
Location: Baltimore 1

Stand-Alone Paper

The Noyce Pre-Residency: Early field experiences used to recruit individuals to become science teachers
Sarah McCorrison*, University of South Alabama, USA
André Green, East Carolina University, USA

Susan Ferguson, University of South Alabama, USA

Stand-Alone Paper

Developing Effective Mentor Teachers for Preservice Science Teachers: Relational, Developmental, and Contextual Dimensions
Maria Rivera Maulucci*, Barnard College, USA

Stand-Alone Paper

Development and Evaluation of a University Seminar to Foster Reflection Competency
Oliver Tepner*, University of Regensburg, Germany
Stefanie Reimer, University of Regensburg, Germany

Stand-Alone Paper

Influence of pre-service teachers' interactive use of content-specific knowledge components from students' point of view
Olutosin Akinyemi, University of the Witwatersrand, South Africa

Climate Literacy and Environmental Awareness

Strand 7: Pre-service Science Teacher Education
24-Mar-25, 1:30 PM-3:00 PM
Location: Baltimore 2

Stand-Alone Paper

Promoting ICT literacy in pre-service science teacher education with gamification-elements designed for species protection awareness
Ann-Katrin Krebs*, Leuphana University Lueneburg, Germany

Stand-Alone Paper

*Climate Literacy Segmentation:
Insights into Greek Pre-Service
Teachers' Climate Knowledge and
Attitudes*

Eirini Chatzara, National and Kapodistrian University of Athens, Greece
Apostolia Galani, National and Kapodistrian University of Athens, Greece
George Arhonditsis, University of Toronto Scarborough, Canada

Stand-Alone Paper

*Science Preservice Teachers'
Transformative Approaches to
Climate Change Education*
Kaylee Laub*, University of California, Santa Barbara, USA
John Galisky, University of California, Santa Barbara, USA
Liliana Garcia, University of California, Santa Barbara, USA
Matthew Shackley, University of California, Santa Barbara, USA
Julie Bianchini, University of California, Santa Barbara, USA

**Co-Design and Professional Learning
in Curriculum Development**

Strand 8: In-service Science Teacher Education

24-Mar-25, 1:30 PM-3:00 PM

Location: Annapolis 3

Stand-Alone Paper

Moving Beyond the NGSS: Integrating Multiple Ways of Knowing and Sustainability into Co-Designed Curriculum Units
Julia Poel*, University of Illinois Urbana-Champaign, USA

Nicholas Leonardi*, University of Illinois Urbana-Champaign, USA

McKenna Lane*, University of Illinois Urbana-Champaign, USA

Barbara Hug*, University of Illinois Urbana-Champaign, USA

Stand-Alone Paper

*How Professional Learning with
Educative Curriculum Materials
Supports Teachers Modeling
Knowledge and Pedagogical Design
Capacity*

Karen Lionberger*, WestEd, USA

Stand-Alone Paper

*Opportunities to Learn Using
Curriculum Cases in Professional
Development*

Nicholas Leonardi*, University of Illinois Urbana-Champaign, USA

Julia Poel*, University of Illinois Urbana-Champaign, USA

McKenna Lane*, University of Illinois Urbana-Champaign, USA

Barbara Hug*, University of Illinois Urbana-Champaign, USA

Stand-Alone Paper

Catalyzing Change: Influence of Teacher Collaborative Curriculum (re)design on Teacher Practice and Student Learning

Sherry Ssoutherland*, Florida State University, USA

Patrick Enderle, Georgia State University, USA

Jennifer Schellinger, Florida State University, USA

Will Rogers, Yale, USA

Ellen Granger, Florida State University, USA

Todd Bevis, Florida State University, USA

Sierra Morandi, Florida State University, USA

Ruveyde Kaya, Florida State University,
USA

Stand-Alone Paper

'Your insights give me a better understanding': Co-Learning in a Curriculum Design Partnership
Symone Gyles*, University of California, Irvine, USA

Integrating Research, Industry, and Pedagogy in STEM Education

Strand 8: In-service Science Teacher Education

24-Mar-25, 1:30 PM-3:00 PM

Location: Magnolia 2

Stand-Alone Paper

Translating Research Lab Experiences into Classroom Experiences: Impacts on Teaching Beliefs, Content, and Pedagogy
Elizabeth Edmondson*, Virginia Commonwealth University, USA

Eric Lindley*, Virginia Commonwealth University, USA

Hsin-Ling Hung, Virginia Commonwealth University, USA

Linda Le, Virginia Commonwealth University, USA

Stand-Alone Paper

Secondary science teachers' goal conflicts in an alternative energy focused engineering RET project
Joseph Brobst*, Old Dominion University, USA

Stand-Alone Paper

From Industry to Classroom: The Benefits of Combining STEM Industry Immersion with Pedagogical PD

Vance Kite*, Kenan Fellows Program for Teacher Leadership, USA

Kevin Winn, Friday Institute for Education Innovation, USA

Teresa Leavens, Friday Institute for Education Innovation, USA

William Reynolds, North Carolina State University, USA

Stand-Alone Paper

Science educators' engagement and practice changes in a design-based implementation research (DBIR) initiative

Melissa Livingston*, Oregon State University, USA

Cory Buxton, Oregon State University, USA
Camila Kennedy, Education Northwest, USA

Advancing Measurement of Science Learning

Strand 10: Curriculum and Assessment

24-Mar-25, 1:30 PM-3:00 PM

Location: Magnolia 1

Stand-Alone Paper

Development and Validation of the Diagnostic Test for Heuristics in Chemistry using Rasch Measurement Approach
Jonathan Barcelo*, Saint Louis University, Philippines

Stand-Alone Paper

Measuring Giftedness in Biology: Development and Validation of Subject-Specific Test Instruments
Colin Peperkorn*, Bielefeld University, Germany

Claas Wegner, Bielefeld University, Germany

Stand-Alone Paper

Applying Machine Learning Methods to Understand Differential Item Functioning in a Flu Knowledge Assessment

Tanvi Banerjee, Wright State University, USA

William Romine*, Kairos Research, USA

Derrick Cox*, Wright State University, USA

Stand-Alone Paper

Assessing Reliability and Validity of a Science Content Knowledge Questionnaire for Elementary PSTs: Rasch Modeling

Soon Lee*, Kennesaw State University, USA

Anna Arias, Kennesaw State University, USA

Preethi Titu, Kennesaw State University, USA

Jessica Reaves, Kennesaw State University, USA

Rasheda Likely, Kennesaw State University, USA

Learning from Black Students, Teachers, and Stories in Science/STEM Education

Strand 11: Cultural, Social, and Gender Issues

24-Mar-25, 1:30 PM-3:00 PM

Location: Azalea 1

Stand-Alone Paper

'In the minority from the jump': Black Men Teachers and Their Experiences in Science Education

Joshua Modeste*, Teachers College, Columbia University, USA

Felicia Mensah*, Teachers College, Columbia University, USA

Stand-Alone Paper

Interrogating anti-Blackness in STEM education: Argument countering the erasure to promoting Black excellence in STEM

Theila Smith*, Brooklyn College (CUNY), USA

Takeshia Pierre*, Tufts University, USA

Bhaskar Upadhyay, University of Minnesota, USA

Stand-Alone Paper

Re-Humanizing the Br-other: Implications for the Next Generation as Advised by Black Men in STEM

Takeshia Pierre*, Tufts University, USA

Latoya Haynes-Thoby, University of Connecticut, USA

Stand-Alone Paper

The Untold Counterstory: A Researcher's Account of Investigating the Experiences of Black Students Studying Biology

Analisa Brown*, University of California, Davis, USA

Supporting Youth Agency and Belonging in STEM Education

Strand 11: Cultural, Social, and Gender Issues

24-Mar-25, 1:30 PM-3:00 PM

Location: Azalea 2

Stand-Alone Paper

Fostering a Sense of Belonging in Native Hawaiian and Pacific Islander STEM Students

Tobias Irish, University of Hawaii at Hilo, USA

Joseph Genz, University of Hawaii at Hilo,
USA

Monique Storie, University of Guam, USA

Stand-Alone Paper

Concurrent Phenomenological Analysis of STEM Career Aspirations in Underrepresented Youth: Role of Experiences and Identity

Amdad Ahmed Awsaf*, Florida International University, USA

Nicole Giansanti, Florida International University, USA

Susan Sunbury, Harvard University, USA

Remy Dou, Florida International University, USA

Stand-Alone Paper

Spacetime matter Entanglements in a Digital Environmental Story

Mary Short*, Smithsonian Institution, USA

Stand-Alone Paper

*You are the Dreamer the Dream:
Black Nerds Reimagining Space Time
Through Counterspaces STEM
Identities*

Brandi Cannon*, Stanford University, USA

Stand-Alone Paper

Bicycles and STEM: Unearthing Black and Brown Genius

Noemi Waight*, University at Buffalo, USA

Ryan Rish, University at Buffalo, USA

Jennifer Tripp*, University at Buffalo, USA

Sophie Wisoff, GOBike, USA

Darryl Marks, East Side Bike Club, USA

Working collaboratively with AI to produce learning progression-based feedback

Strand 12: Technology for Teaching, Learning, and Research

24-Mar-25, 1:30 PM-3:00 PM

Location: Baltimore 5

Related Paper Set

Generating Learning Progression-based Actionable Feedback to Support Students' Three-Dimensional Learning: A Large Language Model Approach

Peng He*, Washington State University, USA

Related Paper Set

Learning Progression-Guided AI Evaluation of Scientific Models To Support Diverse Multi-Modal

Understanding in NGSS Classroom
Leonora Kaldaras*, Texas Tech University, USA

Tingting Li, Michigan State University, USA
Prudence Djagba, Michigan State University, USA

Kevin Haudek, Michigan State University, USA
Joseph Krajcik, Michigan State University, USA

Related Paper Set

Collaborating with Teachers to Generate ML-Based Feedback: Contextualizing and Developing Meaningful and Relevant Feedback

Selin Akgun*, University of Minnesota, USA
Kevin Haudek, Michigan State University, USA

Leonora Kaldaras, Michigan State University, USA

Joseph Krajcik, Michigan State University, USA

Related Paper Set

Feedback on Utilizing Deep Learning AI to Analyze Scientific Models

Tingting Li*, Washington State University, USA

Leonora Kaldares, c. University of Colorado Boulder, USA

Kevin Haudek, Michigan State University, USA

Joseph Krajcik, CREATE for STEM Institute, USA

A Moral Inquiry into Epistemic Insight through Socioscientific Issues: Global Perspectives

Strand 13: History, Philosophy, Sociology, and Nature of Science

24-Mar-25, 1:30 PM-3:00 PM

Location: Camellia 1

Symposium

A Moral Inquiry into Epistemic Insight through Socioscientific Issues: Global Perspectives

Dana Zeidler*, University of South Florida, USA

Fouad Abd-El-Khalick, University of Massachusetts Amherst, USA

Rola Khishfe, American University of Beirut, Lebanon

Yeonjoo Ko, Jeju National University, Korea, Republic of

Shiang-Yao Liu, Taiwan Normal University, Taiwan

Amanda McCrory, University College London, United Kingdom

Li Le, University of Nevada-Reno, USA

Troy Sadler, University of North Carolina, Chapel Hill, USA

Ben Herman, Texas A&M University, USA

Martha Georgiou, University of Athens, Greece

School, Family & Community Participation

Strand 14: Environmental Education and Sustainability

24-Mar-25, 1:30 PM-3:00 PM

Location: Baltimore 3

Stand-Alone Paper

Family Promoted Access to Children's Interactions with Biodiversity and Outdoor Play

Allison Antink-Meyer*, Illinois State University, USA

Anthony Lorsbach, Illinois State University, USA

Ryan Brown, Illinois State University, USA

Stand-Alone Paper

Into the Weeds: Pro-Environmental Behavior Through the North Carolina Native Plant Forum on Facebook

Sera Harold*, North Carolina State University, USA

Carla Johnson, North Carolina State University, USA

Stand-Alone Paper

Middle School Students' Environmental Moral Reasoning on Socioscientific Issues: Terrestrial vs. Extraterrestrial Environments

Cansu Basak Uygun*, Middle East Technical University, Turkey

Özgül Yilmaz-Tuzun, Middle East Technical University, Turkey

Stand-Alone Paper

Bringing Together Global Experts Insights on One Health Education to Enhance Scientific Literacy

Sascha Johann, Justus Liebig University, Germany
Benedikt Heuckmann, University of Münster, Germany
Ulrich Hobusch, University College for Agricultural and Environmental Education, Austria
Kerstin Kremer*, Justus Liebig University, Germany

***In praise of Science Teachers:
Through the Eyes of STEM
Gatekeepers for Black Scientists -
Essential Partners in Researching,
Reframing, and Reforming Science
Teaching, Learning, and Learning to
Teach***

24-Mar-25, 3:15 PM-4:45 PM

Location: Annapolis 2

Administrative Session

Organizers

Rona Robinson-Hill, Ball State University, USA

Shari Watkins, American University, Washington DC, USA

Jonathan Hall, California State University, San Bernardino, USA

Panelists

Lanier Watkins, John Hopkins University, USA

Kristina Kramarczuk, University of Maryland, College Park, USA

Quinton Williams, Howard University, Washington DC, USA

Mariano Sto. Domingo, University of Maryland, USA

Meg Bentley, American University, Washington DC, USA

Publishing, Reviewing, and Writing for JRST

24-Mar-25, 3:15 PM-4:45 PM

Location: Azalea 2

Administrative Session

Organizers

Felicia Moore Mensah, Teachers College, Columbia University, USA

Troy Sadler, University of North Carolina at Chapel Hill, USA

Matthew Kloser, University of Notre Dame, USA

Dana Vedder-Weiss, University of the Negev, Israel

Edna Tan, University of North Carolina Greensboro, USA

Transformative educational environments in STEM classroom: The role of contexts and instructors in centering students

Strand 2: Science Learning: Contexts, Characteristics and Interactions

24-Mar-25, 3:15 PM-4:45 PM

Location: Annapolis 1

Related Paper Set

Transdisciplinary teacher sensemaking during collaborative design centering student and community perspectives

Solaire Finkenstaedt-Quinn*, University of Michigan, USA

Ginger Shultz, University of Michigan, USA

Related Paper Set

*'Meet them where they are':
Chemistry Graduate Teaching Assistants' Noticing for Equity*

Daisy Haas*, University of Michigan, USA

Dani Losinski, University of Michigan, USA

Ginger Shultz, University of Michigan, USA

Related Paper Set

Exploring Chemistry Teaching Assistant Pedagogy and Perspectives in Renovated vs. Unrenovated Instructional Laboratories
Meng-Yang Wu*, The Ohio State University, USA
Cassandra Miller, The Ohio State University, USA
Dalyanne Hernandez-Sanchez, The Ohio State University, USA

Related Paper Set

Why Do They Do What They Do? The drivers of learning assistant facilitation practices
Nicolette Maggiore*, Tufts University, USA
Jessica Karch, TERC, USA
Vesal Dini, Tufts University, USA
Ira Caspari-Gnann, Tufts University, USA

Related Paper Set

Pathways in Chemistry: Investigating the Learning Ecosystems of Introductory Chemistry Undergraduate Students
Jocelyn Nardo*, The Ohio State University, USA
Alison Anderson, The Ohio State University, USA
Johnathan Chisam, The Ohio State University, USA
Samantha Chrin, The Ohio State University, USA

Delving into the challenges and opportunities in STEM education, particularly in diverse and underrepresented contexts

Strand 4: Science Teaching — Middle and High School (Grades 5-12): Characteristics and Strategies
24-Mar-25, 3:15 PM-4:45 PM
Location: Baltimore 4

Stand-Alone Paper

Exploring Students' Information Sources, Interests, and Perceptions on COVID-19 in a Rural US High School
Sahar Alameh*, University of Kentucky, USA
Anna Hoover, University of Kentucky, USA
Savannah Tucker, University of Kentucky, USA
Rebecca Smith, Adair County High School, USA

Stand-Alone Paper

Rural Middle Schools' Design and Implementation of STEM Career and Community Connected Project-based Learning Units
DeNae Kizys*, University of Sout Carolina, USA
Christine Lotter*, University of Sout Carolina, USA
Rachel Gilreath, University of Sout Carolina, USA
Lucas Perez, University of Sout Carolina, USA
Dodie Limberg, University of Sout Carolina, USA
Angela Starrett, University of Sout Carolina, USA

Stand-Alone Paper

Place-Based Learning and Career Interest in STEM: Joint Consideration

of STEM Interest, Identity, and Demographics

Guan Saw*, Claremont Graduate University, USA

Kimberly Megyesi-Brem*, Claremont Graduate University, USA

Ryan Culbertson, Texas Tech University, USA

Paola Rosenberg*, Claremont Graduate University, USA

Stand-Alone Paper

Understanding Experiences of a Science Teacher Teaching Precollege Engineering Design Course: Challenges, Strategies, and Recommendations

Assad Iqbal*, Purdue University, USA

Adam Carberry, The Ohio State University, USA

Medha Dalal, Arizona State University, USA

STEM Career Development and Retention

Strand 5: College Science Teaching and Learning (Grades 13-20)

24-Mar-25, 3:15 PM-4:45 PM

Location: Magnolia 3

Stand-Alone Paper

A National Social and Academic Support Program: STEMM Career Choice and Retention

Or Shav-Artza*, Technion—Israel Institute of Technology, Israel

Shahaf Rocker Yoel, Technion—Israel Institute of Technology, Israel

Yehudit Dori, Technion—Israel Institute of Technology, Israel

Stand-Alone Paper

Exploring the Relationship between STEM Graduate Teaching Assistants Perceived Teaching Autonomy and Pedagogical Discontentment

Alyssa Freeman*, Middle Tennessee State University, USA

Beari Jangir, Middle Tennessee State University, USA

Marco Said, Middle Tennessee State University, USA

Chelsea Rolle, Middle Tennessee State University, USA

Kadence Riggs, Middle Tennessee State University, USA

Grant Gardner, Middle Tennessee State University, USA

Stand-Alone Paper

Teaching Beyond Tenure: The Role of Identity in STEM Faculty's Instructional Choices

Sule Aksoy*, CUNY Graduate Center, USA

Stand-Alone Paper

Examining Post-Lesson Conversations of STEM Undergraduate Faculty Instructional Change Teams: What Makes Them (Un)Productive?

Josie Melton*, Western Washington University, USA

Dustin Van Orman, Western Washington University, USA

Daniel Hanley, Western Washington University, USA

Sophie Westermann, Western Washington University, USA

Abbey Gray, Western Washington University, USA

Makayla Wilson, Western Washington University, USA

Equity and Social Justice in Teacher Education

Strand 7: Pre-service Science Teacher Education

24-Mar-25, 3:15 PM-4:45 PM

Location: Baltimore 1

Stand-Alone Paper

Starting with the Problem: Preservice Elementary Teachers' Ideas for Teaching a Social Justice Science Issue

Jessica Bautista*, University of Michigan, USA

Stand-Alone Paper

Creating a Critically White Practice-Based Science Teacher Education

Jonathan McCausland*, Iona University, USA

Stand-Alone Paper

Conceptualizing a framework for culturally nurturing science teacher identity

Khanh Tran*, Purdue University, USA

Lynn Bryan, Purdue University, USA

Jenna Gist*, Purdue University, USA

Insights on Preservice Teachers' Teaching and Learning practices

Strand 7: Pre-service Science Teacher Education

24-Mar-25, 3:15 PM-4:45 PM

Location: Baltimore 2

Stand-Alone Paper

Pre-Service Teachers' Conceptions of Critical Thinking and Inquiry

Steffen Wagner*, Humboldt-Universität zu Berlin, Germany

Burkhard Priemer, Humboldt-Universität zu Berlin, Germany

Stand-Alone Paper

'They find answers on their own': Novice Teachers' Trajectories for Teaching for Scientific Sensemaking

Patricia Bills*, Oakland University, USA

Amber Bismack, Oakland University, USA

Stand-Alone Paper

Transforming Biology Teacher Education: Fostering Reflective Skills and Research Competence through Inquiry-Based Learning

Pauline Sommerer*, Institute for Biology Education, University of Cologne, Germany

Nadine Großmann, Institute for Biology Education, University of Cologne, Germany

Jörg Großchedl, Institute for Biology Education, University of Cologne, Germany

Stand-Alone Paper

Enhancing Scientific Literacy in Distance Elementary Education: A closeup on Pre-Service Teacher Beliefs and Practices

Keren Dagan*, Technion, Israel

Dina Tsybulsky, Technion, Israel

**Professional Development and
Resource Utilization for Early Career
STEM Educators**

**Strand 8: In-service Science Teacher
Education**

24-Mar-25, 3:15 PM-4:45 PM

Location: Annapolis 3

Stand-Alone Paper

*Emotional Resilience Narratives in
New Science Teachers' Lessons:
Delineating Emotion-Attuned Science
Instruction*

Ella Yonai*, University of Georgia, USA

Elizabeth Ayano, University of Georgia,
USA

Jose Pavez, Western Illinois University,
USA

Lisa Borgerding, Kent State University,
USA

Shannon Navy, Kent State University, USA

Stand-Alone Paper

*'Foundational knowledge is
paramount': Early Career Science
Teachers Use of Personal Resources*

Adepeju Prince*, Kent State University,
USA

Shannon Navy, Kent State University, USA

Stand-Alone Paper

*Early Career Science and
Mathematics Teachers' Access to and
Use of Resources Over Two Years*

Robert Idsardi*, Eastern Washington
University, USA

Emily Hamada, Eastern Washington
University, USA

Shannon Navy, Kent State University, USA

Lisa Borgerding, Kent State University,
USA

Julie Luft, University of Georgia, USA

Ella Yonai, University of Georgia, USA

Stand-Alone Paper

*Novice Secondary Teachers'
Developing Beliefs about Project-
Based Learning*

KARTHIGEYAN SUBRAMANIAM*,

University of North Texas, USA

Mila Rosa Carden*, University of North
Texas, USA

Chris Long, University of North Texas, USA

Pamela Pamela Esprívalo Harrell,
University of North Texas, USA

Marlon Harris, University of North Texas,
USA

Ruthanne Thompson, University of North
Texas, USA

**Teacher Identity and Emotional
Dynamics in Science Education
Practice**

**Strand 8: In-service Science Teacher
Education**

24-Mar-25, 3:15 PM-4:45 PM

Location: Magnolia 2

Stand-Alone Paper

*The role of leveraging emotions in
elementary science teachers making
changes to practice*

Andrea Phillips*, Indiana University, USA

Stand-Alone Paper

*Latent Profiles of U.S. Science Teacher
Identities*

Xiufeng Liu*, University of Macau, China

Jennifer Tripp, University at Buffalo, USA

Stand-Alone Paper

*Investigating Science Leadership
Professional Identity*

Jennifer Bateman*, University of Georgia,
USA

Brooke Whitworth, Clemson University,
USA

Golnaz Arastoopour-Irgens, Vanderbilt
University, USA

Stand-Alone Paper

*Embodied Praxis: How Teacher
Identity Influences Instruction*
Heather Shaffery*, University of Oklahoma,
USA

**Innovative Approaches for
Developing Science Curriculum and
Assessment**

Strand 10: Curriculum and Assessment

24-Mar-25, 3:15 PM-4:45 PM

Location: Magnolia 1

Stand-Alone Paper

*Implementing Grand Challenges in
Middle School Classrooms: A Case
Study of Innovative Curricula
Implementation*

Rebecca Lesnefsky*, University of North
Carolina, USA

Natasha Segal, Weizmann Institute of
Science, Israel

Zhen Xu, University of North Carolina, USA

Nannan Fan, University of North Carolina,
USA

Heewoo Lee, University of North Carolina,
USA

Shira Passentin, Weizmann Institute of
Science, Israel

Keren Dalyot, Weizmann Institute of
Science, Israel

David Fortus, Weizmann Institute of
Science, Israel

Troy Sadler, University of North Carolina,
USA

Stand-Alone Paper

*'You get to tinker with your brain':
Middle school students' perspectives
on three-dimensional, phenomenon-
driven assessments*

Cari Herrmann-ABell*, BSCS Science
Learning, USA

Clarissa Deverel-Rico, BSCS Science
Learning, USA

Patricia Olson, BSCS Science Learning,
USA

Chris Wilson, BSCS Science Learning, USA

Stand-Alone Paper

*Designing Three-Dimensional
Assessment Tasks for Classroom
Formative Assessment*

Alexander Paulchell*, University of
Arizona, USA

Malissa Hubbard*, University of Arizona,
USA

Mingfeng Xue, University of California,
Berkeley, USA

Kristin Gunckel, University of Arizona, USA

Linda Morell, University of California,
Berkeley, USA

Mark Wilson, University of California,
Berkeley, USA

Stand-Alone Paper

*Scripted Curriculum in the Science
Classroom*

Maizie Dyess*, University of Nevada, Las
Vegas, USA

Burak Sahin*, University of Nevada, Las
Vegas, USA

Katherine Wade-Jaimes*, University of
Nevada, Las Vegas, USA

Critical Science Consciousness: A Framework and Applications Across Science Teachers, Teacher Educators, and Researchers

Strand 11: Cultural, Social, and Gender Issues

24-Mar-25, 3:15 PM-4:45 PM

Location: Azalea 1

Symposium

Critical Science Consciousness: A Framework and Applications Across Science Teachers, Teacher Educators, and Researchers

Megan Walser*, Michigan State University, USA

Kate Miller, Michigan State University, USA
Sinead Brien, University of South Carolina Upstate, USA

Lenora Crabtree, University of North Carolina Charlotte, USA

Nick Confer, Washington-Liberty High School, USA

Nicole Hefty, West Ottawa High School, USA

Taylor MacKenzie, Waverly High School, USA

Andrea Nguyen, Macatawa Bay Middle School, USA

Teachers' Approaches to Indigenizing STEM Education through Instructional Practice and Curriculum

Strand 11: Cultural, Social, and Gender Issues

24-Mar-25, 3:15 PM-4:45 PM

Location: Annapolis 4

Symposium

Teachers' Approaches to Indigenizing STEM Education through Instructional Practice and Curriculum

Kathryn Gardner-Vandy*, Oklahoma State University, USA

Jillian Cicek, University of Manitoba, Canada

Rebekah Hammack*, Purdue, USA
Mishack Gumbo, University of South Africa, South Africa

Noelani Puniwai, University of Hawai'i at Mānoa, USA

Julie Robinson, University of North Dakota, USA

Rif'ati Handayani, University of Jember – Indonesia, Indonesia

Beth Covitt, University of Montana, USA

Leena Kanandjebo, University of Namibia, Namibia

Faustina Kashinauua, University of Namibia, Namibia

Student Performance in STEM Education

Strand 12: Technology for Teaching, Learning, and Research

24-Mar-25, 3:15 PM-4:45 PM

Location: Baltimore 5

Stand-Alone Paper

Utilizing Eye Tracking Data to Monitor the Impact of Multimedia Learning Content on Student Performance

Muhammad Rehman*, University of Florida, USA

Do Hyong Koh, University of Florida, USA
Christine Wusylko, University of Florida, USA

Priya Prasad, University of Florida, USA

Xiaoman Wang, University of Florida, USA
Pavlo Antonenko, University of Florida, USA

Kara Dawson, University of Florida, USA

Albert Ritzhaupt, University of Florida, USA
Jonathan Martin, University of Florida, USA

Ellen Martin, University of Florida, USA

Stand-Alone Paper

Impact of Computing-STEM Curriculum on University Students' Computer Programming Self-efficacy, Understanding, and Problem-Solving Performance

Shu-Fen Lin*, National Changhua University of Education, Taiwan

Dong-Ke Huang, National Changhua University of Education, Taiwan

Stand-Alone Paper

Fostering Scientific Creativity in Health-Allied STEM Students Using the Contextualized General Physics Courseware Package

Fredyrose Ivan Pinar*, De La Salle University, Philippines

Lydia Roleda, De La Salle University, Philippines

Stand-Alone Paper

Exploring the Potential of STEM Media Read-Alouds

Lauren Shea*, American University, USA

Climate Change Action

Strand 14: Environmental Education and Sustainability

24-Mar-25, 3:15 PM-4:45 PM
Location: Baltimore 3

Stand-Alone Paper

The Knowledge and Action Intentions of Tomorrow's Citizens in Facing the Climate Change Challenge

Oshra Aloni*, The Weizmann Institute of Science, Israel

Ornit Spektor-Levy, Bar Ilan University, Israel

Orit Ben Zvi Assaraf, Ben Gurion University of the Negev, Israel

Yael Shwartz, The Weizmann Institute of Science, Israel

Anat Yarden, The Weizmann Institute of Science, Israel

Stand-Alone Paper

Localizing Climate Change Education: Impacts on Student Knowledge and Agency in High School Science Classrooms

Jeffrey Snowden*, BSCS Science Learning, USA

Emily Harris, BSCS Science Learning, USA

Lindsey Mohan, BSCS Science Learning, USA

Stand-Alone Paper

A Cross-Cultural Study Comparing Turkish and Indonesian Preservice Science Teachers' Orientations towards Climate Change

Osman Aksit, Bogazici University, Turkey
Gaye Ceyhan, Bogazici University, Turkey
Rita Hagevik*, University of North Carolina – Pembroke, USA
Nejla Yürük, Gazi University, Turkey
Betül Alatlı, Balıkesir University, Turkey
Sabri Kocakülah, Balikesir University, Turkey
Emine Adadan, Bogazici University, Turkey
Sedat Uçar, Cukurova University, Turkey
Ebru Muğaloğlu, Bogazici University, Turkey
Laura Wheeler, Brigham Young University, USA

Hartono Hartono, Sriwijaya University, Indonesia
Rita Inderawati, Sriwijaya University, Indonesia
Sofendi Sofendi, Sriwijaya University, Indonesia
Pelin Aksüt Arslan, Bolu Abant Izzet Baysal University, Turkey
Kathy Trundle, Utah State University,

Stand-Alone Paper

Diverse Roles of Environmental Educators: Science Content Experts, Professional Development Providers, Environmental Advocates, and Mentors

Hamza Malik*, Lloyd Center for the Environment, USA
Stephen Witzig*, University of Massachusetts Darmouth, USA
Rachel Stronach*, Lloyd Center for the Environment, USA

Implementing Science Education Reform: Understanding Stakeholder Perspectives, Roles, and Factors

Strand 15: Policy, Reform, and Program Evaluation

24-Mar-25, 3:15 PM-4:45 PM
Location: Camellia 1

Stand-Alone Paper

A spotlight on science education in Australian early childhood teacher qualifications

Cristina Guarrella*, The University of Melbourne, Australia
Caroline Cohrssen, University of New England, Australia
Naomi Lilley, The University of Melbourne, Australia

Stand-Alone Paper

The Grand challenges Project in Middle Schools: Principals as Adopters and Leaders of Reform Curricula

Keren Dalyot*, Weizmann Institute of Science, Israel
Troy Sadler, University of North Carolina Chapel Hil, USA
David Fortus, Weizmann Institute of Science, Israel

Stand-Alone Paper

Exploring the Nexus of Teaching and Research Productivity in a Research-Intensive University among STEM Faculty

Anna Kye*, University of California Irvine, USA
Brian Sato, University of California Irvine, USA
Kameryn Denaro, University of California Irvine, USA

Graduate Student Forum

24-Mar-25, 4:45 PM-6:15 PM

Location: Cherry Blossom Terrace

Social Event

Jennifer Bateman, University of Georgia,
Athens, USA

Poster Session

24-Mar-25, 4:45 PM-6:15 PM

Location: Cherry Blossom Ballroom

Strand 1: Science Learning: Development of student understanding

Poster

Modeling as an Approach to Encourage Moral Deliberations during SSI Decision-Making

Jamie Elsner*, University of North Carolina at Chapel Hill, USA

Zhen XU, University of North Carolina at Chapel Hill, USA

Eric Kirk, University of North Carolina at Chapel Hill, USA

Laura Zangori, University of Missouri, USA

Strand 1: Science Learning: Development of student understanding

Poster

Unlocking Interdisciplinary Insights and Understandings on Carbon Cycling Through Topic Modeling

Hyesun You*, The University of Iowa, USA

Minju Hong, University of Arkansas, USA

Seungho Maeng, Seoul National University of Education, Korea, Republic of

Strand 1: Science Learning: Development of student understanding

Poster

Fostering Students' Understanding of Ecosystems and Metamodeling Knowledge

Jinzhi Zhou*, Indiana University, USA

Qiuyu Lin, Rutgers University, USA

Zach Ryan, Indiana University, USA

Cindy Hmelo-Silver, Indiana University, USA

Joshua Danish, Indiana University, USA

Ravit Duncan, Rutgers University, USA

Clark Chinn, Rutgers University, USA

Strand 1: Science Learning: Development of student understanding

Poster

Exploring the role of the body in supporting mechanistic reasoning

Genelle Diaz-Silveira*, Boston University, USA

Eve Manz, Boston University, USA

Strand 1: Science Learning: Development of student understanding

Poster

Learning How the Respiratory System Works Through Scientific Modeling in Early Childhood

Dulce González Ramírez, Instituto Superior de Investigación y Docencia para el Magisterio, Mexico

Silvia Ramos De Robles, University of Guadalajara, Mexico

Verónica Pérez Serrano Flores*, Universidad Panamericana, Mexico

Strand 1: Science Learning: Development of student understanding

Poster

Defining Conceptual Understanding: A Three-Stage Model Using Generative Learning Theory Combined with Dynamic Binding Approach

Shanshan Lu, Shandong Normal University, China

Strand 1: Science Learning: Development of student understanding Poster

Fostering Scientific Practices Through Critique: The Impact of Structured Peer Feedback on Ninth-Grade Students

SaeYeol Yoon*, Delaware State University, USA

Nurcan Keles, Dicle University, Turkey

Claudia Aguirre-Mendez, Emporia State University, USA

Brian Hand, University of Iowa, USA

Strand 1: Science Learning: Development of student understanding

Poster

The Pathways to Quantum Immersion Program

Jessica Rosenberg*, George Mason University, USA

Nancy Holincheck*, George Mason University, USA

Benjamin Dreyfus, George Mason University, USA

Xiaolu Zhang, George Mason University, USA

Gen Konowe*, South Lakes High School, USA

Iamen Ibrahim, Forest Park High School, USA

Nathan D'Cruze, Richard Montgomery High School, USA

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Poster

Exploring high school students' practical epistemology, epistemic emotions, and self-efficacy in STEM learning activities

Min-Hsien Lee, National Taiwan Normal University, Taiwan

Wei-Shou Chen*, National Taiwan Normal University, Taiwan

Chia-Ching Lin, National Kaohsiung Normal University, Taiwan

Yen-Yuan Chen, National Taiwan University, College of Medicine, Taiwan

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Poster

Predictors of intention to donate stem cells to leukemia patients among young students

Julia Holzer*, University of Bremen, Germany

Doris Elster, University of Bremen, Germany

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Poster

Responsive Instruction Engagement in Science Practices: A Systematic Review of Pedagogical Strategies in Biology Education

Niki Koukoulidis*, University of Florida, USA

Julie Brown, University of Florida, USA

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Poster

Instructional Supports and Contexts for Enhancing the Level of Scientific Argumentation among Elementary Students

Hoon Jeong*, Department of Science Education, Seoul National University, Korea, Republic of

Soo-Yean Shim, Department of Science Education, Seoul National University, Korea, Republic of

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Poster

An Integrated Co-Design Framework: Applying Co-Design Across Science Education Settings

Anne Levendusky*, University of Florida, USA

Darby Drageset, University of Florida, USA

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Poster

Affection and cognition in science lessons at Elementary School: Discursive interactions with and about artifacts

Deborah Cotta*, Universidade Federal de Minas Gerais, Brazil

Danusa Munford, Universidade Federal do ABC, Brazil

Vanessa Neves, Universidade Federal de Minas Gerais, Brazil

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Poster

Epistemic Practices and Critical Thinking: Identifying Relationships Based on Chemistry Activities in a Brazilian School

Diorleno Santos, Universidade de São Paulo, Brazil

Matheus Damasceno, Universidade de São Paulo, Brazil

Lúcia Sasseron*, Universidade de São Paulo, Brazil

Strand 2: Science Learning: Contexts, Characteristics and Interactions

Poster

What STEM Career Explorations Reveal About Rural High School

Students' Motivations Towards STEM Career Pathways

Sera Harold*, North Carolina State University, USA

Brooke Bentley, North Carolina State University, USA

Margaret Blanchard, North Carolina State University, USA

Strand 3: Science Teaching — Primary School (Grades preK-6): Characteristics and Strategies

Poster

Lessons Learned Using ChatGPT to Create First Grade Science Lesson Plans

Wardell Powell*, Framingham State University, USA

Steve Courchesne, Framingham State University, USA

Strand 3: Science Teaching — Primary School (Grades preK-6): Characteristics and Strategies

Poster

Primary and Intermediate Elementary Teacher Background and Confidence in NGSS Implementation

Laura Longo*, SUNY Stony Brook, USA
Angela Kelly, SUNY Stony Brook, USA

Strand 3: Science Teaching — Primary School (Grades preK-6): Characteristics and Strategies

Bridging the Gap: Using Literacy to Teach Quantum Concepts in Elementary Education

Jennifer Simons*, George Mason University, USA

Cindy Hamblin*, Prince William County Schools, USA

Maya Butler-Hall, Anne Arundel County Public Schools, USA

Marin Moore, Alexandria City Public Schools, USA

Chanelle Carter, Prince George's County Public Schools, USA

Nancy Holincheck*, George Mason University, USA

Stephanie Dodman, George Mason University, USA

Jessica Rosenberg, George Mason University, USA

Benjamin Dreyfus, George Mason University, USA

Xiaolu Zhang, George Mason University, USA

Strand 3: Science Teaching — Primary School (Grades preK-6): Characteristics and Strategies

Poster

A Theoretical Game-Based Model For Scaffolding Elementary Science Instruction

Rob Monahan*, North Carolina State University, USA

James Minogue, North Carolina State University, USA

Strand 3: Science Teaching — Primary School (Grades preK-6): Characteristics and Strategies

Poster

Cultivating a STEM-driven School Culture: A Librarian's Journey

Carol Waters*, University of Houston-Clear Lake, USA

Strand 4: Science Teaching — Middle and High School (Grades 5-12): Characteristics and Strategies

Poster

Teaching Circuits Using the EPo Concept: Impact on Conceptual Understanding in Middle Schools

Tilmann Steinmetz*, University of Tübingen, Germany
Jan-Philipp Burde, University of Tübingen, Germany

Thomas Schubatzky, Universität Innsbruck, Austria

Verena Spatz, TU Darmstadt, Germany

Martin Hopf, Universität Wien, Austria

Claudia Haagen-Schützenhöfer, Universität Graz, Austria

Lana Ivanjek, Johannes Kepler Universität Linz, Austria

Benedikt Gottschlich, University of Tübingen, Germany

Thomas Wilhelm, Goethe-Universität Frankfurt am Main, Germany

Strand 4: Science Teaching — Middle and High School (Grades 5-12): Characteristics and Strategies

Poster

A digital and metacognitive tool to support high school students in decision making

Jana-Sabrin Blome, TU Dortmund University, Germany

Insa Melle*, TU Dortmund University, Germany

Strand 4: Science Teaching — Middle and High School (Grades 5-12): Characteristics and Strategies

Poster

Remember, Recall, Retain: Unleashing the Power of CTCA in Computer Studies

Deborah Agbanimu, National Open University of Nigeria, Nigeria

Peter Okebukola*, Lagos State University-Nigeria

Juma Shabani, University of Burundi, Burundi

Franklin Onowugbeda, Lagos State University, Nigeria

Esther Peter, Lagos State University, Nigeria

Adekunle Oladejo, Lagos State University, Nigeria

Olasunkanmi Gbeleyi, Lagos State

University, Nigeria

Ademola Ibukunolu, Lagos State

University, Nigeria

Strand 4: Science Teaching — Middle and High School (Grades 5-12): Characteristics and Strategies

Poster

The Data Fluency Framework for Teaching: A Conceptual Model of Teacher Knowledge for Data-Rich Instruction

Nicole Wong*, WestEd, USA

Rasha Elsayed, WestEd, USA

Leticia Perez, WestEd, USA

Corynn Del Core, WestEd, USA

Kirsten Daehler, WestEd, USA

Strand 4: Science Teaching — Middle and High School (Grades 5-12): Characteristics and Strategies

Poster

Science teachers understanding of interdisciplinary teaching

Tiina Naissoo, Tallinn University, Estonia

Priit Reiska*, Tallinn University, Estonia

Birgit Soosalu, Tallinn University, Estonia

Strand 4: Science Teaching — Middle and High School (Grades 5-12): Characteristics and Strategies

Poster

Deliberative argumentation to improve the understanding of climate change in a group of secondary students

Pablo Escobar, Pontificia Universidad Católica de Valparaíso, Chile

Claudia Vergara, Universidad Alberto Hurtado, Chile

Antonia Larraín, Universidad Alberto Hurtado, Chile

Hernan Cofré*, Pontificia Universidad Católica de Valparaíso, Chile

Strand 4: Science Teaching — Middle and High School (Grades 5-12): Characteristics and Strategies

Poster

Food and Cooking: Inclusive Methods to "Do Science" and Draw on Student Assets

Kate Strangfeld*, Harvard University, USA

Pia Sørensen, Harvard University, USA

Strand 5: College Science Teaching and Learning (Grades 13-20)

Poster

Sharing Our Stories: Fostering Belonging in STEM Classrooms Using a Personal Narrative Activity

Melissa Zwick*, Stockton University, USA

Ally Hunter, Landmark College, USA

Strand 5: College Science Teaching and Learning (Grades 13-20)

Poster

Exploring The Relationship Between Self-Efficacy And Teaching Approach In Graduate Teaching Assistants

Cody Smith*, Missouri State University, USA

Strand 5: College Science Teaching and Learning (Grades 13-20)

Poster

Factors of Undergraduate Students' Academic Success in Introductory Chemistry: A Systematic Literature Review

Jessica Chestnut*, North Carolina State University, USA

Carla Johnson, North Carolina State University, USA

Strand 5: College Science Teaching and Learning (Grades 13-20)
Poster

New recognitions of self during a summer undergraduate research experience at an ecological field station

Anna Grinath*, Idaho State University, USA

Strand 5: College Science Teaching and Learning (Grades 13-20)

Poster

Chemistry Graduate Teaching Assistants' Pedagogical Commitments for Equity- and Justice-Focused Teaching Across Anti-DEI Contexts

Daisy Haas*, University of Michigan, USA

Safron Milne*, University of Michigan, USA

Ginger Shultz, University of Michigan, USA

Strand 5: College Science Teaching and Learning (Grades 13-20)

Poster

An Inclusive STEM Environment: Experiences of Students with Disabilities in the Introductory Chemistry Course

Natasha Johnson*, University of Toledo, USA

Strand 5: College Science Teaching and Learning (Grades 13-20)

Poster

Assessing the Impact of an Undergraduate Summer Research Program for Deaf and Hearing Chemistry Students

Isobel Cobb, James Madison University, USA

Frances Thiry, James Madison University, USA

Anneliese Rogerson, James Madison

University, USA

Emma McGehee, James Madison

University, USA

Savannah Sprouse, James Madison

University, USA

Ashlynn Stacy, James Madison University, USA

Trinity Dovan, James Madison University, USA

Joseph Harsh*, James Madison University, USA

Strand 5: College Science Teaching and Learning (Grades 13-20)

Poster

Research Skill Development of Undergraduate STEM Students in the LSAMP Undergraduate Research Program

Niyazi Erdogan*, Texas A&M University, USA

Michael Preuss, West Texas A&M University, USA

John Avila, Texas A&M University, USA

Karen Butler-Purry, Texas A&M University, USA

Shannon Walton, Texas A&M University, USA

Pamela Obiomon, Prairie View A&M University, USA

Mahmoud Khasawneh, Texas A&M International University, USA

Barbara Szczerbinska, Texas A&M University - Corpus Christi, USA

Karan Watson, Texas A&M University, USA

Strand 5: College Science Teaching and Learning (Grades 13-20)

Poster

How Student Perceptions of Lab and Lecture Relate to Ideas on "Thinking Like a Chemist"

Michelle Sinapuelas*, San Francisco State University, USA

Seiham Alansary*, San Francisco State University, USA

Angelica Kochkarova*, San Francisco State University, USA

Strand 6: Science Learning in Informal Contexts

Poster

'They were normal people like us': exploring effects of a scientist-facilitated intervention on young people

Shannon Stubbs*, University of Galway, Ireland

Jennifer DeWitt, University of Galway, Ireland

Muriel Grenon, University of Galway, Ireland

Strand 6: Science Learning in Informal Contexts

Poster

Measuring sense of belonging in a museum: The impact of a museum-based teaching residency program

Anna MacPherson*, American Museum of Natural History, USA

Naina Abowd*, American Museum of Natural History, USA

Alexis Mayfield, American Museum of Natural History, USA

Margaret Hoffman, American Museum of Natural History, USA

Jacob Sienko, American Museum of Natural History, USA

Strand 6: Science Learning in Informal Contexts

Poster

A Meta-Analysis of Informal Science Education's Role in Shaping Student Interest and Attitudes

Xin Xia*, University of Virginia, USA

Lillian Bentley, University of Virginia, USA

Xitao Fan, The Chinese University of Hong Kong, China

Robert Tai, University of Virginia, USA

Strand 6: Science Learning in Informal Contexts

Poster

Nurturing Community and Reciprocity in Out-of-School STEM Programs: A Conceptual Framework

george schafer*, Drexel University, USA

Strand 6: Science Learning in Informal Contexts

Poster

The Impact of a Science Camp on Elementary Students' Science Identity and STEM Career Awareness

Elsun Seung*, Indiana State University, USA

Soonhye Park, North Carolina State University, USA

Aeran Choi, Ewha Womans University, Korea, Republic of

Strand 6: Science Learning in Informal Contexts

Poster

Female Students Choosing Science Fair: A Tale of Science Teachers' Impact and Science Identity Development

Justin Andersson*, University of Nebraska at Omaha, USA

Strand 6: Science Learning in Informal Contexts

Poster

Connections between Science Curiosity and Youth's Making in Afterschool STEM Programs

Jennifer Weible*, Central Michigan University, USA

Strand 6: Science Learning in Informal Contexts

Poster

Engaging Latinx students in scientific inquiry and metacognition through authentic STEM experiences

Angela Chapman*, UTRGV, USA

Uma Ganesan*, UTRGV, USA

Mario Almanza, UTRGV, USA

Lluvia Garcia, UTRGV, USA

Yailen Gomez, UTRGV, USA

Isabel Amaro, UTRGV, USA

Strand 7: Pre-service Science Teacher Education

Poster

Incorporating Place within Science Methods: Preservice Teacher

Perceptions of an Outdoor Learning Experience

Steph Dean*, Clemson University, USA

Summer Landreth*, Clemson University, USA

Strand 7: Pre-service Science Teacher Education

Poster

Supporting the Teaching of Science and Engineering in Elementary and Middle Grades for Multilingual Learners

Romola Bernard*, University of North Georgia, USA

Max Vazquez Dominguez, University of North Georgia, USA

Strand 7: Pre-service Science Teacher Education

Poster

Exploring simple teaching intervention to improve preservice elementary teachers' trust in science

Asghar Gill, Western Michigan University, USA

Anum Khushal, University of Nebraska Lincoln, USA

William Cobern, Western Michigan University, USA

Strand 8: In-service Science Teacher Education

Poster

Investigating How a Curriculum-Based Professional Learning Community Can Support Teachers' and Researchers' Learning Processes

Kristine Wilbrecht*, University of Nevada, Reno, USA

Elizabeth de los Santos*, University of Nevada, Reno, USA

Darcy Clark, University of Nevada, Reno, USA

Jasmine Wong-Fortunato, University of Nevada, Reno, USA

Strand 8: In-service Science Teacher Education

Poster

Professional Development for Improved Alignment of Extracurricular Learning with the Classroom

Markus Emden, University of Teacher Education, Switzerland

Frank Hannich, zhaw Zurich University of Applied Sciences, Switzerland

Armin Duff, Swiss Science Center Technorama, Switzerland

Tania Kaya, zhaw Zurich University of Applied Sciences, Switzerland

Lara Leuschen, Phaenomena, Switzerland

David Nef, Swiss Science Center Technorama, Switzerland

Strand 8: In-service Science Teacher Education Poster

Novelty Space, Sense of Place Social Justice Science Teaching
Gail Richmond*, Michigan State University, USA
Roberta Hunter, NJ Audubon, USA

Strand 8: In-service Science Teacher Education Poster

Teachers' Perspectives on the Implementation of the Scientific Inquiry and Practices Curriculum in Taiwan
YiWen Hung*, The Affiliated Senior High School of National Taiwan Normal University, Taiwan
Shiang-Yao Liu, National Taiwan Normal University, Taiwan

Strand 8: In-service Science Teacher Education Poster

Characteristics of Elementary Teachers who Demonstrate Strong Science Content Knowledge
Alexys Skidmore*, Brigham Young University, USA
Hannah Dudley*, Brigham Young University, USA
Ryan Nixon, Brigham Young University, USA
Stefan Sorge, Leibniz Institute for Science and Mathematics Education, Germany

Strand 8: In-service Science Teacher Education Poster

"I've got to meet students where they are": The critical care from one science teacher

Sierra Morandi*, Florida State University, USA

Sherry Southerland, Florida State University, USA

Strand 8: In-service Science Teacher Education Poster

Problems and Possibilities: The challenges of an early career science teacher
J. Mesiner*, University of Maryland, USA

Strand 8: In-service Science Teacher Education

Poster
Early Career STEM Teachers Perceptions of Resource Quality
Shannon Navy*, Kent State University, USA
Lisa Borgerding, Kent State University, USA
Robert Idsardi, Eastern Washington University, USA
Adepeju Prince, Kent State University, USA

Strand 8: In-service Science Teacher Education

Poster
Investigating Science Teachers Epistemological Beliefs and Conceptions of Models and Modeling in Science Classrooms
Laura Chalfant*, North Carolina State University, USA
Elsun Seung, Indiana State University, USA
Soonhye Park, North Carolina State University, USA
Grace Carroll, North Carolina State University, USA
Elizabeth Kluckman, North Carolina State University, USA
William Reynolds, North Carolina State University, USA
Scott Ragan, North Carolina State University, USA

Jason Painter, North Carolina State University, USA

Strand 8: In-service Science Teacher Education Poster

Impacts of professional learning to support teachers' design capacity for localized climate units

Lindsey Mohan, BSCS Science Learning, USA

Emily Harris, BSCS Science Learning, USA

Candice Guy-Gaytán*, BSCS Science Learning, USA

Jeffrey Snowden, BSCS Science Learning, USA

Strand 8: In-service Science Teacher Education Poster

The Impact of Utilizing the Socioscientific Issues Approach on Teacher Satisfaction

Erin Shoop*, Saint Joseph's University, USA

Stacy Olitsky, Saint Joseph's University, USA

Strand 8: In-service Science Teacher Education Poster

Construction of Agency by Science Teachers' Educators in the planning of a professional developmental course

Amanda Magalhães*, Universidade de São Paulo, Brazil

Daniela Scarpa*, Universidade de São Paulo, Brazil

Danusa Munford*, Universidade Federal do ABC, Brazil

Strand 8: In-service Science Teacher Education Poster

Teachers Managing Tensions in Developing Assessments in a Professional Learning Community

JaeBin Lee*, Seoul National University, Korea, Republic of

Soo-Yean Shim, Seoul National University, Korea, Republic of

Strand 8: In-service Science Teacher Education Poster

Exploring the Impact Mechanism of Interdisciplinary Teaching Practices among Elementary Science Teachers

Mengqian Wang*, China Research Institute for Science Popularization, China

Hong Cui, Central China Normal University, China

Strand 8: In-service Science Teacher Education Poster

Building Teachers' Capacity for Data-Rich Instruction: Impact from a Professional Learning Course

Pai-rou Chen*, WestEd, USA

Nicole Wong*, WestEd, USA

Rasha Elsayed, WestEd, USA

Leticia Perez, WestEd, USA

Kirsten Daehler, WestEd, USA

Strand 8: In-service Science Teacher Education Poster

Inclusive Science Education: Ethnographic Insights into Teacher Development and Classroom Diversity

Rafael Lopes*, USP, Brazil

Danusa Munford, Universidade Federal do ABC, Brazil

Daniela Scarpa, USP, Brazil

Strand 8: In-service Science Teacher Education Poster

Early Career Science and Math Teacher Wellbeing: Self-Care Needs and Practices

Lisa Borgerding*, Kent State University, USA

Shannon Navy, Kent State University, USA

Ella Yonai, University of Georgia, USA

Elizabeth Ayano, University of Georgia, USA

Strand 8: In-service Science Teacher Education Poster

Social Resource Access and Use for Early Career STEM Teachers

Emily Hamada*, Eastern Washington University, USA

Robert Idsardi, Eastern Washington University, USA

Strand 8: In-service Science Teacher Education Poster

Investigating the Role of Science Practices and PCK in the Implementation of Modeling Instruction

Laura Chalfant*, North Carolina State University, USA

William Reynolds, North Carolina State University, USA

Grace Carroll, North Carolina State University, USA

Elizabeth Kluckman, North Carolina State University, USA

Soonhye Park, North Carolina State University, USA

Scott Ragan, North Carolina State University, USA

Jason Painter, North Carolina State University, USA

Strand 8: In-service Science Teacher Education Poster

Exploring Science Teacher Leaders' Professional Growth Plans

Julianne Wenner, Clemson University, USA

Brooke Whitworth*, Clemson University, USA

Strand 8: In-service Science Teacher Education Poster

Coherence in Professional Learning/Development: An Exploratory Study of District Science Leaders

Julie Luft*, University of Georgia, USA

Ella Yonai, University of Georgia, USA

Xinyu He, University of Georgia, USA

Paulo Carneiro Loureiro, University of Georgia, USA

Brooke Whitworth, Clemson University, USA

Strand 8: In-service Science Teacher Education Poster

Dimensions of Teachers Pedagogical Content Knowledge (PCK) of Argumentation

Teresa Shume*, North Dakota State University, USA

Brooke Thiel, North Dakota State University, USA

Strand 10: Curriculum and Assessment Poster

Designing Socio-scientific Issues-Based Instruction Using Culturally Responsive Frameworks

Rebecca Lesnfsky*, University of North Carolina, USA

Keren Dalyot, Weizmann Institute of Science, Israel
Nannan Fan, University of North Carolina, USA
Heewoo Lee, University of North Carolina, USA
Shira Passentin, Weizmann Institute of Science, Israel
Natasha Segal, Weizmann Institute of Science, Israel
Zhen Xu, University of North Carolina, USA
David Fortus, Weizmann Institute of Science, Israel
Troy Sadler, University of North Carolina, USA

Strand 10: Curriculum and Assessment Poster

Semiconductor Education: A Scoping Review of Programs, Practices, and Challenges in Preparing the Future Workforce

Jaquelina Schmittlen-Garbocci*, University of Tennessee-Knoxville, USA
Hongyan Yang, University of Tennessee-Knoxville, USA
Rachel Wong, University of Tennessee-Knoxville, USA
Joanna Millunchick, Indiana University, USA
Shalaunda Reeves, University of Tennessee-Knoxville, USA

Strand 10: Curriculum and Assessment Poster

Exploring the inclusion of systems thinking in middle school science curricula and textbooks
Melike Hanedar*, Boğaziçi University, Turkey
Gaye Ceyhan, Boğaziçi University, Turkey

Strand 10: Curriculum and Assessment

Poster

Introduction about Automated Scoring System for Descriptive Assessment and Application
Sangeui Lee*, SEOUL NATIONAL UNIVERSITY, Korea, Republic of
Minsu Ha, Seoul National University, Korea, Republic of

Strand 10: Curriculum and Assessment Poster

Incorporating Science Topics in Nontraditional Subjects: Teacher Strategies in K-12 Classrooms
Siddika Guzey*, Purdue University, USA
Emily Haluschak*, Purdue University, USA
Christine McDonnell, Purdue University, USA
Deana Lucas, Purdue University, USA
Tamara Moore, Purdue University, USA

Strand 10: Curriculum and Assessment Poster

An Approach to Unpacking NGSS Performance Expectations for Language-Diverse First Graders
Nonye Alozie, SRI International, USA
Arif Rachmatullah*, SRI International, USA
Daisy Rutstein, edCount, LLC, USA
Ron Fried, SRI International, USA

Strand 10: Curriculum and Assessment Poster

Using Multiple Models to Learn Population-Level Viral Transmission
Zhen Xu, University of North Carolina at Chapel Hill, USA
Jamie Elsner*, University of North Carolina at Chapel Hill, USA
Eric Kirk, University of North Carolina at Chapel Hill, USA
Troy Sadler, University of North Carolina at Chapel Hill, USA

Laura Zangori, University of Missouri, USA

Strand 10: Curriculum and Assessment Poster

Equitable Science Curriculum for Multilingual Learners: Curriculum Critique

Anna Kim*, Penn State, USA

Strand 10: Curriculum and Assessment Poster

The impact of Place-Based Education within the framework of Next Generation Science Standards three dimensions

Heewoo Lee*, University of North Carolina at Chapel Hill, USA

Troy Sadler, University of North Carolina at Chapel Hill, USA

Strand 10: Curriculum and Assessment Poster

Lessons Learned from Developing NGSS-Aligned Formative Assessments for 1st Graders

Arif Rachmatullah*, SRI International, USA

Nonye Alozie, SRI International, USA

Hui Yang, SRI International, USA

Daisy Rutstein, EdCount, LLC, USA

Anna Jennerjohn, SRI International, USA

Ron Fried, SRI International, USA

Marta Mielicki, SRI International, USA

Strand 10: Curriculum and Assessment Poster

Incorporation of Inquiry and STEM Education in Grade Six Science Classroom: Bangladesh Perspective

Kazi Shahidullah*, Bangladesh University of Professionals, Bangladesh

Md. Ahsan Habib, Dhaka University, Bangladesh

Strand 11: Cultural, Social, and Gender Issues

Poster

Promoting Sociotechnical Perspectives of Engineering During a Summer Bridge Program

Jacob Pleasants*, University of Oklahoma, USA

Strand 11: Cultural, Social, and Gender Issues

Poster

'I hope this program fails miserably': Rural resistance toward queer-focused science education research

Gary Wright*, University of Missouri, USA

Strand 11: Cultural, Social, and Gender Issues

Poster

Analysis of Genetic Determinism and Essentialism Discourses in Online Communities

Ji Eun Kim*, Seoul National University, Korea, Republic of

Sun Young Shin, Seoul National University, Korea, Republic of

Seung Ah Park, Seoul National University, Korea, Republic of

MinSu Ha, Seoul National University, Korea, Republic of

Strand 11: Cultural, Social, and Gender Issues

Poster

Rooted in Culture, Growing Equity; An African Inspired Approach to Teach Logic Gate

Olasunkanmi Gbeleyi, Lagos State University (LASU-ACEITSE), Nigeria

Peter Okebukola, Lagos State University (LASU-ACEITSE), Nigeria

Juma Shabani, University of Burundi, Burundi

Deborah Agbanimu, National Open University of Nigeria (NOUN), Nigeria
Esther Funmilayo, Lagos State University (LASU-ACEITSE), Nigeria

Strand 11: Cultural, Social, and Gender Issues Poster

'Yes – For Us Too": Learning in Informal Environments in a Minority Population
Tali Tal*, Technion, Israel Institute of Technology, Israel
Maha Jaramneh, Technion, Israel institute of Technology, Israel
Abeer Watted, Al-Qasemi Academic College of Education, Israel

Strand 11: Cultural, Social, and Gender Issues Poster

High school makerspace experience and the gender gap in STEM identity and career interest
Chen Chen*, The University of Hong Kong, Hong Kong
Yuhan Li, The University of Hong Kong, Hong Kong
Gerhard Sonnert, Harvard-Smithsonian Center for Astrophysics, USA
Philip Sadler, Harvard-Smithsonian Center for Astrophysics, USA
Susan Sunbury, Harvard-Smithsonian Center for Astrophysics, USA
Sherry Lassiter, MIT, USA

Strand 11: Cultural, Social, and Gender Issues Poster

Navigating with Cultural Wealth: Reframing the Narrative of Undergraduates' Journeys Toward STEM Degrees
Sheila Castro*, University of Florida, USA
Bruce Carroll, University of Florida, USA

Janice Mejia, Northwestern University, USA
Kent Crippen, University of Florida, USA

Strand 11: Cultural, Social, and Gender Issues Poster

Exploring Associations Between Event-Based (Mis)Recognition by STEM Authorities with STEM Identity and Career Aspirations
Amdad Ahmed Awsaf*, Florida International University, USA
Remy Dou, Florida International University, USA
Gerhard Sonnert, Harvard University, USA
Philip Sadler, Harvard University, USA

Strand 11: Cultural, Social, and Gender Issues Poster

Exploring Instructional Strategies Used to Promote Equity in Science Classrooms: A Systematic Literature Review
Elizabeth Ayano*, University of Georgia, USA
Julie Luft, University of Georgia, USA
Ella Yonai, University of Georgia, USA

Strand 11: Cultural, Social, and Gender Issues Poster

Science Teachers' Perspectives and Experiences on Multicultural Dynamics in Science Classrooms
Selvet Genek, The Ohio State University, USA
Lin Ding, The Ohio State University, USA

Strand 11: Cultural, Social, and Gender Issues

Poster

Black STEM Students and Faculty within the Mid-Atlantic Region: A Systematic Literature Review

Zaki Hawkins*, American University, USA

Ihsan Hawkins*, American University, USA

Jess Edwards, American University, USA

Martinique Sealy, American University, USA

Shari Watkins, American University, USA
Brian McGowan, American University, USA

Strand 11: Cultural, Social, and Gender Issues

Poster

Vanquishing the Fear of Optics: Unleashing the Power of the Culturo-Techno-Contextual Approach (CTCA)

John Ogonenwe, African Center of Excellence for Innovative and Transformative STEM Education, LASU, Nigeria

Tunde Rahman, LAGOS STATE UNIVERSITY, Nigeria

Peter Okebukola*, LAGOS STATE UNIVERSITY, Nigeria

Juma Shabani, University of Burundi, Burundi

Ademola Ibukunolu, LAGOS STATE UNIVERSITY, Nigeria

Strand 11: Cultural, Social, and Gender Issues

Poster

Assessing Relational Equity in Small Groups in a STEM Learning Environment

Vanessa Figueroa Weston*, Grinnell College, USA

Paul Hutchison, Grinnell College, USA

Strand 12: Technology for Teaching, Learning, and Research

STEM Teachers' Digital Competence: A Comparative Analysis by Gender and Subject Matter

Adel Althubyani, Taif University, Saudi Arabia

Strand 12: Technology for Teaching, Learning, and Research

Poster

Creating engaging learning spaces for teaching Machine Learning to adolescents

Manav Sharma*, University of Miami, USA

Ji Shen*, University of Miami, USA

Strand 12: Technology for Teaching, Learning, and Research

Poster

Perceptions of Using Artificial Intelligence-Based Educational Tools

Sabrina Stanley*, University of North Alabama, USA

Hannah Howell, University of North Alabama, USA

Strand 12: Technology for Teaching, Learning, and Research

Poster

Impact of Personalized Learning Approach (UDA 1.0) on students Cognitive Proficiency in ICT

Uchenna Ugwuoke*, LASU-ACEITSE, Nigeria

Peter Okebukola, LASU-ACEITSE, Nigeria

Rahman Alade, LASU-ACEITSE, Nigeria

Rasheed Sanni, LASU-ACEITSE, Nigeria

Abdurrazaq Olawale, LASU-ACEITSE, Nigeria

**Strand 12: Technology for Teaching,
Learning, and Research**

Poster

*Curating the Future: Integrating
Digital Curation for Personalized
Learning in Science Education*

Gal Stern, Technion - Israel Institute of
Technology, Israel

Dina Tsybulsky*, Technion - Israel Institute
of Technology, Israel

**Strand 12: Technology for Teaching,
Learning, and Research**

Poster

*Is AI a Viable Coder: An Exploratory
Study Using ChatGPT for In Vivo
Coding*

Xinyu He*, University of Georgia, USA

Ella Yonai, University of Georgia, USA

Julie Luft, University of Georgia, USA

Elizabeth Ayano, University of Georgia,
USA

Joseph Deluca, University of Georgia, USA

Yuxi Huang, University of California, Irvine,
USA

**Strand 12: Technology for Teaching,
Learning, and Research**

Poster

*The Impact of ChatGPT on Science
Education: Teachers' Perceptions
Across Diverse Disciplines*

Oluokayode Apata, Texas A&M University,
USA

**Strand 12: Technology for Teaching,
Learning, and Research**

Poster

*Technology enhanced collaborative
argumentation and discourse in
socioscientific issues*

Sharfun Islam Nancy*, University of South
Florida, USA

**Strand 12: Technology for Teaching,
Learning, and Research**

Poster

*Exploring Equity Maps App as a Tool
to Bridge Research and Practice*

Mandy Dunphy*, Baylor University, USA

Alison Warren*, University of Iowa, USA

David Nelson, Asociación Escuelas

Lincoln/Founder of Equity Maps App,
Argentina

Brian Hand, University of Iowa, USA

**Strand 12: Technology for Teaching,
Learning, and Research**

Poster

*Exploring LLM's Capabilities in
Measuring Science PCK Using Lesson
Plans and Open-ended Responses*

Arif Rachmatullah*, SRI International, USA

Shaishav Tayde, SRI International, USA

Nonye Alozie, SRI International, USA

John Niekrasz, SRI International, USA

Sophia Ouyang, SRI International, USA

Marta Mielicki, SRI International, USA

Hui Yang, SRI International, USA

**Strand 12: Technology for Teaching,
Learning, and Research**

Poster

*Enhancing Conceptual
Understanding of Friction Force
Through Dynamic Modelling by Using
the ArMo Application*

Tugba Yuksel*, Recep Tayyip Erdogan
University, Turkey

Ibrahim Delen, Usak University, Turkey

Bahadir Namdar, Ege University, Turkey

Ince Gokhan, Istanbul Technical
University, Turkey

Strand 13: History, Philosophy, Sociology, and Nature of Science

Poster

How do Inservice Teachers Conceptualize the Value-laden Nature of Technology?

Jerrid Kruse*, Drake University, USA
Isaiah Kent-Schneider, Drake University, USA
Lucas Menke, Drake University, USA

Strand 13: History, Philosophy, Sociology, and Nature of Science

Poster

Tensions in Nature of Science Assessment

Sarah Voss*, Western Washington University, USA
Debi Hanuscin, Western Washington University, USA
Isaiah Kent-Schneider, Drake University, USA

Strand 13: History, Philosophy, Sociology, and Nature of Science

Poster

A comparative case study of PCK of NOS with a biology teacher teaching three content

Paola Núñez, Pontificia Universidad Católica de Valparaíso, Chile
Catalina Cañete, Pontificia Universidad Católica de Valparaíso, Chile
Carolina Parraguez*, Pontificia Universidad Católica de Valparaíso, Chile
Hernan Cofré, Pontificia Universidad Católica de Valparaíso, Chile

Strand 14: Environmental Education and Sustainability

Poster

Sustainable and healthy nutrition among young people: TPB-based study

Julia Holzer*, University of Bremen, Germany

Doris Elster, University of Bremen, Germany

Strand 14: Environmental Education and Sustainability

Poster

Exploring the long-term insights gained from a climate learning experience in an innovative museum exhibit

Benjamin Janney*, University of Utah, USA
Lynne Zummo, University of Utah, USA
Marc Whiting, University of Utah, USA
Jordan Giron, University of Utah, USA

Strand 14: Environmental Education and Sustainability

Poster

Evaluating XR Interventions in Environmental Education: A Systematic Literature Review

K. "Ren" Mendoza*, University of Nebraska at Omaha, USA
Noah Glaser, University of Missouri, USA
Jule Krüger, University of Potsdam, Germany
Mohan Yang, Texas A&M University, USA
Kimberly Moeller, University of Missouri, USA

Strand 14: Environmental Education and Sustainability

Poster

Development of Global Goals Sustainability Mindsets Instrument
Hyunju Lee*, Smithsonian Science Education Center, USA
Jackie Kolb*, Smithsonian Science Education Center, USA

Strand 14: Environmental Education and Sustainability

Poster

Surfacing Local Ecological Knowledge to Establish Needs for a Community Marine Science Conservation Initiative

Hada Herring, University of Florida, USA

Julie Brown*, University of Florida, USA

Kent Crippen, University of Florida, USA

Shae Kelliher, University of Florida Marine Animal Rescue, USA

Suzanna Mickey, University of Florida Marine Animal Rescue, USA

Michael Walsh, University of Florida Marine Animal Rescue, USA

Stefanie Gazda, Cedar Key Dolphin Project, USA

Strand 14: Environmental Education and Sustainability

Poster

A Systematic Literature Review of Ocean Literacy in Non-formal Education Initiatives

Lisa Coe*, University of Florida, USA

Hada Herring, University of Florida, USA

Julie Brown, University of Florida, USA

Strand 14: Environmental Education and Sustainability

Poster

Pre-service Teachers' Climate Emotions in a Course on Climate Change

Emily Olsen*, Penn State University, USA

Aubrey Grzywacz, Penn State University, USA

Strand 14: Environmental Education and Sustainability

Poster

Climate Denial in Media: Brazilian Students' Understandings of Uncertainty in Scientific Models

Mariana Monteiro, University of São Paulo, Brazil

Lúcia Sasseron*, University of São Paulo, Brazil

Strand 14: Environmental Education and Sustainability

Poster

Students Beliefs towards Climate Change and its Teaching

Helin Semilarski*, University of Tartu, Estonia

Helen Semilarski, University of Tartu, Estonia

Katrin Vaino, University of Tartu, Estonia

Ana Valdmann, University of Tartu, Estonia

Strand 14: Environmental Education and Sustainability

Poster

A Case Study of Leveraging Climate Change Curriculum as a means of Science Communication

Shweta Lahiri*, University of Georgia, USA

Ayça Fackler, University of Missouri, USA

Emily Miller, University of Georgia, USA

Hong Tran, Purdue University, USA

Joseph Deluca, University of Georgia, USA

Strand 14: Environmental Education and Sustainability

Poster

Effective Strategies for Climate Change Education in Elementary Context: A Systematic Literature Review

Qingna Jin, Cape Breton University, Canada

JRST Editor's Dinner (Invitation Only)

24-Mar-25, 6:30 PM-8:00 PM

Location: Camellia 2

Social Event

Book Talk: Applying Machine

Learning in Science Education

Research: When, how, and why?

24-Mar-25, 7:00 PM-8:00 PM

Location: Annapolis 1

Social Event

Organizers

Xiaoming Zhai, University of Georgia,
Athens, USA

Kent Crippen, University of Florida, USA

Presenters

Marcus Kubsch, Freie Universität Berlin,
Germany

Peter Wulff, Heidelberg University of
Education, Germany

Christina Krist, Stanford University, USA

***Kiki and community: Choose your
adventure social for LGBTQ+ folk and
allies to build connections and
community***

24-Mar-25, 7:00 PM-8:00 PM

Location: Baltimore 1

Social Event

Organizers

Sara Porter, University of North Carolina at
Greensboro, USA

Colby Tofel-Grehl, Utah State University,
Logan, USA

**In-Person Conference
25 March 2025**

**Committee Business Meetings
25-Mar-25, 7:00 AM-8:00 AM**

**Membership Committee Meeting
Location: Annapolis 1**

**Program Committee Meeting
Location: Annapolis 2**

**Research Committee Meeting
Location: Annapolis 3**

**Social Media, Website &
Communications Committee
Meeting
Location: Baltimore 1**

**Awards Committee Meeting
Location: Baltimore 2**

**Elections Committee Meeting
Location: Baltimore 3**

**Equity and Ethics Committee
Meeting
Location: Baltimore 4**

**Professional Learning and Institutes
Committee Meeting
25-Mar-25, 7:00 AM-8:00 AM
Location: Baltimore 5**

**Graduate Student Committee
Meeting
Location: Magnolia 1**

**International Committee Meeting
Location: Magnolia 2**

**Scholarships Committee Meeting
Location: Magnolia 3**

**Advancing Connections Between
Research and Practice: JRST
Research Worth Reading
Recognition
25-Mar-25, 8:15 AM-9:45 AM
Location: Magnolia 3**

**Administrative Session
Organizers
Tina Voss, University of Nevada, USA
Marcus Kubsch, Freie University-Berlin,
Germany
Cesar Delgado, North Carolina State
University, USA
Carla Zembal-Saul, Penn State University,
USA
Shiang-Yao Liu, National Taiwan Normal
University, Taiwan**

Exploring Connections Between Self and Science

Strand 2: Science Learning: Contexts, Characteristics and Interactions

25-Mar-25, 8:15 AM-9:45 AM

Location: Annapolis 1

Stand-Alone Paper

Student Success Stories in Urban Science Education: Exploring Science as Refuge

Kristina Salciccioli*, University of Toronto, Canada

Erminia Pedretti, University of Toronto, Canada

Stand-Alone Paper

Investigating the relationships between students perspectives of future consequences and interest in a STEM career

Nespolino Antonietta, University Federico II, Italy

Silvia Galano, University Federico II, Italy

Italo Testa*, University Federico II, Italy

Stand-Alone Paper

Expanding Elementary STEM Education Through Teacher-Researcher Complementarity: A Rural STEM Education Research Case Study

Christine McGrail, University of North Dakota, USA

Kendi Loy, Northwood Schools, USA

Stand-Alone Paper

Examining Black Girls' Experiences in STEM: A Systematic Literature Review

Olayinka Mohorn*, University of Memphis, USA

Alexis Riley*, New York University, USA

Demetrice Smith-Mutegi*, Old Dominion University, USA

Monica Miles, University at Buffalo-SUNY, USA

Joi Merritt, James Madison University, USA

Using data to foster deeper learning with consideration for the human elements that influence teaching practices

Strand 4: Science Teaching — Middle and High School (Grades 5-12): Characteristics and Strategies

25-Mar-25, 8:15 AM-9:45 AM

Location: Baltimore 4

Stand-Alone Paper

The role of Representations in supporting evaluating Measurement Data

Stephen Mayer*, Humboldt-Universität zu Berlin, Germany

Burkhard Priemer, Humboldt-Universität zu Berlin, Germany

Stand-Alone Paper

Measurement Uncertainties in Secondary Education: when can the topic be introduced?

Karel Kok*, Humboldt-Universität, Germany

Burkhard Priemer, Humboldt-Universität, Germany

Stand-Alone Paper

Enhancing Explanation Quality in Science Education: The Impact of Content-Based and Structural Interventions

Franziska Hagos*, Humboldt-Universität zu Berlin, Germany

Steffen Wagner, Humboldt-Universität zu Berlin, Germany

Burkhard Priemer, Humboldt-Universität zu Berlin, Germany

Stand-Alone Paper

A Humanistic Stance in Looking at Teacher Experiences with Data Investigations of Extreme Weather
Asli Sezen-Barrie*, University of California Irvine, USA

Josephine Louie, EDC, USA

Emily Fagan, EDC, USA

Kevin Waterman, EDC, USA

Pam Buffington, EDC, USA

Deb Morrison, Clear Environmental, USA

Brian Fitzgerald, Mount Washington Observatory, USA

Applying a Knowledge-in-Pieces Perspective to Biology Education Research

Strand 5: College Science Teaching and Learning (Grades 13-20)

25-Mar-25, 8:15 AM-9:45 AM

Location: Annapolis 2

Symposium

Applying a Knowledge-in-Pieces Perspective to Biology Education Research

Julia Svoboda*, Tufts University, USA

Adrian Adams, University of Utah, USA

Molly Bolger Bolger, University of Georgia, USA

Jennifer Doherty, Michigan State University, USA

Paula Lemons, University of Georgia, USA

Matthew Lira, University of Iowa, USA

Rachel Dowdy, University of Georgia, USA

Philimon Zaagbil, University of Georgia, USA

Sugat Dabholkar, Tufts University, USA

Eric Kusi, University of Georgia, USA

Addressing Science Literacy in Informal Spaces

Strand 6: Science Learning in Informal Contexts

25-Mar-25, 8:15 AM-9:45 AM

Location: Magnolia 2

Stand-Alone Paper

Exploring scientists' participation in science communication through the Dimension of their Impact Identity
Brenda Guerrero, Florida International University, USA

Stand-Alone Paper

The Importance of Science Education, Scientific Knowledge, and Evaluation Strategies for Detection of COVID-19 Misinformation

Ayelet Baram-Tsabari*, Technion - Israel Institute of Technology, Israel

Shakked Dabran-Zivan, Technion - Israel Institute of Technology, Israel

Stand-Alone Paper

Improving Elementary Students' Knowledge and Perceived Utility Value of Earth Science through Informal Science Education

Kim Cheek*, University of North Florida, USA

Elizabeth Broth, University of North Florida, USA

Tamara Reeves, University of North Florida, USA

Ryan Shamet, University of North Florida, USA

Exploring Socioscientific Issues in Preservice Teacher Education

Strand 7: Pre-service Science Teacher Education

25-Mar-25, 8:15 AM-9:45 AM

Location: Baltimore 2

Stand-Alone Paper

Challenges of Preservice In-service Teachers on the Codesigning SSI Materials: Two Sides of the Coin

Ferah Özer Aker, Koc University, Turkey
Cigdem Han-Tosunoglu, Marmara University, Turkey

Stand-Alone Paper

Socioscientific Issues: Perceptions of Elementary Pre-service Teachers in an Undergraduate Science Methods Course

Stephanie Arthur*, University of South Florida, USA

Ly Do, University of South Florida, USA
Melanie Kinskey, Texas A&M University, USA

Stand-Alone Paper

Change in Teachers SSI Teaching Beliefs Through SSI Based Instruction

Özgül Yılmaz Tüzün*, METU, Turkey

Ece Kilaç, METU, Turkey

Stand-Alone Paper

Teacher Profiles Emerging from Curriculum Design Through SSI Based Instruction

Ece Kilaç*, METU, Turkey

Özgül Yılmaz Tüzün, METU, Turkey

Grappling with Critical Problems of Practice within our Diverse Informal Elementary Science Teacher Education Community

Strand 7: Pre-service Science Teacher Education

25-Mar-25, 8:15 AM-9:45 AM

Location: Woodrow Wilson Ballroom

Symposium

Grappling with Critical Problems of Practice within our Diverse Informal Elementary Science Teacher Education Community

Christina Schwarz*, Michigan State University, USA

Amber Bismack, Oakland University, USA
Jessica Bautista, University of Michigan, USA

Martha Canipe, Northern Arizona University, USA

Kristin Gunckel, University of Arizona, USA

James Hancock II, Alma College, USA

Amal Ibourk, Florida State University, USA

Kathryn Lanouette, William & Mary, USA

TJ McKenna, Boston University, USA

Meenakshi Sharma, Mercer University, USA

Supporting and Exploring Equitable Teaching practices

Strand 7: Pre-service Science Teacher Education

25-Mar-25, 8:15 AM-9:45 AM

Location: Baltimore 1

Stand-Alone Paper

The Impact of an Early Field Experience on Mathematics and Science Teachers' Culturally Affirming Practices

Meredith Kier*, William & Mary, USA

Lindy Johnson, William & Mary, USA

Stand-Alone Paper

The Role of Epistemic Vexations in the Learning of Preservice Science

Teachers About Responsive Teaching

Ruveyde Kaya, Florida State University,
USA

Sherry Southerland*, Florida State
University, USA

Stand-Alone Paper

*A Call for Collective Practices and Tool
Development to Support Culturally
Ambitious Science Teaching*

Matthew Kloser*, University of Notre
Dame, USA

Heather Johnson, Vanderbilt University,
USA

Kirsten Mawyer*, University of Hawaii at
Manoa, USA

Scott McDonald*, Penn State University,
USA

David Stroupe*, University of Utah, USA

**Advancing Inclusive and Equitable
Science Education Practices**

**Strand 8: In-service Science Teacher
Education**

25-Mar-25, 8:15 AM-9:45 AM

Location: Annapolis 3

Stand-Alone Paper

*Practitioners' perspectives on inclusive
science education*

Laura Pannullo*, University Bielefeld,
Germany

Melanie Basten, University Bielefeld,
Germany

Laura Ferreira González, University of
Cologne, Germany

Felix Pawlak, University of Tübingen,
Germany

Bianka Wartig, University Bielefeld,
Germany

Lisa Stinken-Rösner, University Bielefeld,
Germany

Stand-Alone Paper

*Centering Curricular Customizations
on an Equity Goal to Support Science
Teachers' Beliefs about Equitable
Sensemaking*

Maria Moreno Vera*, Boston College, USA

Austin Moore, Boston College, USA

Katherine McNeill, Boston College, USA

Renee Affolter, OpenSciEd, USA

Samuel Lee, California State University,
Long Beach, USA

Stand-Alone Paper

*Science Meets Democracy: Do
Teachers Vote 'Yes' on Democratic
Teaching*

Heba EL-Deghaidy*, American University
in Cairo, Egypt

Stand-Alone Paper

*Leveraging emancipatory pedagogies
to support science teachers of color
through a Noyce teaching fellowship*

Vanessa Louis*, University of Michigan,
USA

Natalie King*, Georgia State University,
USA

NARST Connects

25-Mar-25, 8:15 AM-9:45 AM

Location: Camellia 1

Discussion Session

This is a time for conference attendees to
connect and discuss professionally related
topics of their choosing. There are no
designated presenters or moderators.

Participants are expected to adhere to the NARST Program Code of Conduct.

Initial Results from an Iterative Program Design for Educating Science Education Leaders
Strand 8: In-service Science Teacher Education

25-Mar-25, 8:15 AM-9:45 AM

Location: Camellia 2

Related Paper Set

Designing a Program for Science Education Teacher-Leaders

Elizabeth Lewis*, University of Nebraska-Lincoln, USA

Wendy Smtih, University of Nebraska-Lincoln, USA

Dan Claes, University of Nebraska-Lincoln, USA

David Harwood, University of Nebraska-Lincoln, USA

Dawn Jarmillo, RMC Research Corporation, USA

Gina Matkin, University of Nebraska-Lincoln, USA

LJ McElravy, University of Nebraska-Lincoln, USA

Related Paper Set

Changes in MTFs Understanding about Science Education Leadership

Rachel Benzoni*, University of Nebraska-Lincoln, USA

Gina Matkin, University of Nebraska-Lincoln, USA

Wendy Smith, University of Nebraska-Lincoln, USA

Elizabeth Hasseler, University of Nebraska-Lincoln, USA

LJ McElravy, University of Nebraska-Lincoln, USA

Related Paper Set

MTFs Discipline-specific Science Subject Matter Knowledge and Pursuing National Board Certification

Elizabeth Hasseler*, University of Nebraska-Lincoln, USA

Rachel Benzoni*, University of Nebraska-Lincoln, USA

Dan Claes, University of Nebraska-Lincoln, USA

David Harwood, University of Nebraska-Lincoln, USA

Elizabeth Lewis*, University of Nebraska-Lincoln, USA

Related Paper Set

The Thread of Equity Throughout a Noyce MTF Program

Gina Matkin, University of Nebraska-Lincoln, USA

Rachel Benzoni*, University of Nebraska-Lincoln, USA

Elizabeth Lewis*, University of Nebraska-Lincoln, USA

Elizabeth Hasseler*, University of Nebraska-Lincoln, USA

Building Scientific Literacy and Socio-Scientific Reasoning in Diverse Contexts

Strand 10: Curriculum and Assessment

25-Mar-25, 8:15 AM-9:45 AM

Location: Magnolia 1

Stand-Alone Paper

Exploring Gaps in Socio-scientific Reasoning Skills: Insights from Students in Grades 5-7

Yidi Wu, Beijing Normal University, China

Yangdan Liu*, Beijing Normal University, China

Jing Lin*, Beijing Normal University, China
Ling Liang*, La Salle University, USA
Xiufeng Liu*, University of Macau, China

Stand-Alone Paper

Evaluating Singapore Secondary Students' Grasp of Scientific Practices

Yann Shiou Ong*, National Institute of Education, Nanyang Technological University, Singapore

Yew-Jin Lee, National Institute of Education, Nanyang Technological University, Singapore

Miechie Leowardy, National Institute of Education, Nanyang Technological University, Singapore

Stand-Alone Paper

Developing an SSI-based STEAM in promoting the development of students scientific literacy and agency

Ha My Anna Mang*, Macquarie University, Australia

Hy Eun Chu*, Macquarie University, Australia

Sonya Martin, Seoul National University, Korea, Republic of

Stand-Alone Paper

Analysis of NGSS Alignment in Wildfire Science Curricula: Using Natural Disasters as Anchoring Phenomena

Spencer Eusden*, University of Nevada, Reno, USA

Li Ke, University of Nevada, Reno, USA

Fostering Cultural Responsiveness and Social Justice among Science/STEM Teachers

Strand 11: Cultural, Social, and Gender Issues

25-Mar-25, 8:15 AM-9:45 AM

Location: Azalea 1

Stand-Alone Paper

Enacting Culturally Responsive Science Education in Rural Urban Districts: Noyce Alumni Perspectives From Two Universities

Dominic Fantacone*, SUNY Cortland, USA

Elizabeth Edmondson*, Virginia Commonwealth University, USA

Aimee Ellington, Virginia Commonwealth University, USA

Sean Nolan, SUNY Cortland, USA

Stand-Alone Paper

Cultural heritage in steam teacher professional development in Nepal

Bhaskar Upadhyay*, University of Minnesota, USA

Lindsey Smaka, University of Minnesota, USA

Samantha Barragan, University of Minnesota, USA

Stand-Alone Paper

Developing Science Equity Ambassadors to Tackle Inequities in Science/STEM Education

Tara Nkrumah*, Arizona State University, USA

Stand-Alone Paper

More Than Buzz Words: Teachers' motivations, understandings, and evolution in teaching science for social justice

Katherine Wade-Jaimes*, University of Nevada, USA

Maizie Dyess, University of Nevada, USA
Burak Sahin, University of Nevada, USA

Stand-Alone Paper

Pre-Service Elementary Teacher's Perspectives of Teaching Science Equitably
Joi Merritt*, James Madison University, USA
Angela Webb, James Madison University, USA

Teachers' Perception and Practice in Digital Era

Strand 12: Technology for Teaching, Learning, and Research
25-Mar-25, 8:15 AM-9:45 AM
Location: Baltimore 5

Stand-Alone Paper

Innovative Hybrid Science Education: Integrating Citizen Science and Digital Learning for Future-Ready Teachers
Selçuk Kılınç*, Middle East Technical University, Turkey
Gökhan Öztürk, Middle East Technical University, Turkey

Stand-Alone Paper

Examining the Role of Human Actors within Elementary Science Digital Teaching Simulations
Jamie Mikeska*, ETS, USA
Shreyashi Halder, ETS, USA
Devon Kinsey, ETS, USA
Pamela Lottero-Perdue, Towson University, USA

Stand-Alone Paper

ChatGPT versus humans: teacher selection considerations when

choosing student cluster characterization in chemistry
Shelley Rap*, Weizmann Institute of Science, Israel
Elad Jacobson, Weizmann Institute of Science, Israel
Giora Alexandron, Weizmann Institute of Science, Israel
Ron Blonder, Weizmann Institute of Science, Israel

Nature of Science in Science Curriculum and Teacher Education: A Global Perspective
Strand 13: History, Philosophy, Sociology, and Nature of Science
25-Mar-25, 8:15 AM-9:45 AM
Location: Annapolis 4

Symposium

Nature of Science in Science Curriculum and Teacher Education: A Global Perspective
Wonyong Park*, University of Southampton, United Kingdom
Ryan Summers*, University of North Dakota, USA
Jacob Pleasants*, University of Oklahoma, USA
Richard Brock*, King's College London, United Kingdom
Tetsuo Isozaki*, Hiroshima University, Japan
Dina Tsybulsky*, Technion - Israel Institute of Technology, Israel
Anna Pshenichny-Mamo, Technion - Israel Institute of Technology, Israel
Haya Ben Simon*, Technion - Israel Institute of Technology, Israel
Ferah Özer, Koc University, Turkey
Çiğdem Han-Tosunoğlu, Marmara University, Turkey

Radu Bogdan Toma, University of Burgos, Spain

Olivia Levrini, University of Bologna, Italy

Martina Caramaschi, University of Bologna, Italy

Sara Satanassi, University of Bologna, Italy

Kerstin Kremer, Justus Liebig University Giessen,

Elvira Schmidt, Justus Liebig University Giessen, Germany

Ivã Gurgel, University of São Paulo,

Maurício Pietrocola, University of São Paulo,

***Fostering authentic engagement:
Strategies for partnered climate
change education across the science
education landscape***

Strand 14: Environmental Education and Sustainability

25-Mar-25, 8:15 AM-9:45 AM

Location: Baltimore 3

Symposium

***Fostering authentic engagement:
Strategies for partnered climate
change education across the science
education landscape***

Heidi Cian, Maine Mathematics and Science Alliance, USA

Michelle Brown, Florida International University, USA

Julie Luft*, University of Georgia, USA

Joseph DeLuca, University of Georgia, USA

Emily Miller, University of Georgia, USA

Steven Fletcher, St. Edwards University, USA

Remy Dou, Florida International University, USA

Tali Tal, Technion Israel Institute of Technology, Israel

Hong Tran, Purdue University, USA

Shweta Lahiri, University of Georgia, USA

A Celebration of Distinguished Contribution through Research Award Recipients: A Discussion of the Future of Science Education

25-Mar-25, 10:00 AM-11:30 AM

Location: Azalea 2

Administrative Session

Organizer

Amelia Gotwals, Michigan State University, East Lansing, USA

Panelist

Mei-Hung Chiu, National Taiwan Normal University, Taiwan

Roundtables 2

25-Mar-25, 10:00 AM-11:30 AM

Location: Woodrow Wilson Ballroom

Strand 2: Science Learning: Contexts, Characteristics and Interactions

WIP Roundtable

Empowering Teachers as Co-Researchers: The implementation of a community-based research project with High School Students

Sarah Fankhauser*, Oxford College of Emory University, USA

Susan Watts-Taffe, University of Cincinnati, USA

Jonathan Breiner, University of Cincinnati, USA

Nicholas Shaver, University of Cincinnati, USA

Strand 2: Science Learning: Contexts, Characteristics and Interactions

WIP Roundtable

Negotiation within Argumentation – Guiding Student Discourse

Carla McAuliffe*, IGES, USA

Donna Governor, UNG, USA

Lorraine Ramirez Villain, UNG, USA

Strand 1: Science Learning: Development of student understanding

WIP Roundtable

From Waste to Wisdom: The Role of Active Student Sensemaking in Addressing Complex Problem Course

Peter Locher*, American University, USA

Makennah Troy, American University, USA

Sarah Irvine Belson, American University, USA

Strand 2: Science Learning: Contexts, Characteristics and Interactions

WIP Roundtable

Minimizing the Academic Achievement Gap Between Advantaged and Disadvantaged Students in Denmark, Norway, and Sweden

Patricia Patrick*, Columbus State University, USA

Daniel Purvis*, Columbus State University, USA

Strand 4: Science Teaching — Middle and High School (Grades 5-12): Characteristics and Strategies

WIP Roundtable

Identifying Arts Integration in Science Scope (2019 to 2023) with Science Arts Integration Awareness Model

Patricia Patrick*, Columbus State University, USA

Kendel Purvis*, Columbus State University, USA

Strand 4: Science Teaching — Middle and High School (Grades 5-12): Characteristics and Strategies

WIP Roundtable

Educators' Perspectives on Integrating Data Science/Water into STEM, Physical Education and Literacy Curriculum.

Anne Degnan*, Columbia University, USA

Laureline Josset, Columbia University, USA

Strand 4: Science Teaching — Middle and High School (Grades 5-12): Characteristics and Strategies

WIP Roundtable

Environmental Injustices and Their Role as Hyper-local Phenomenon in High School Classrooms

Justin McFadden*, University of Louisville, USA

Linda Fuselier, University of Louisville, USA

Strand 4: Science Teaching — Middle and High School (Grades 5-12): Characteristics and Strategies

Roundtable

Differences between students and teachers in the perceived relevance of a localized climate change unit

Candice Guy-Gaytán*, BSCS Science Learning, USA

Jeffrey Snowden, BSCS Science Learning, USA

Lindsey Mohan, BSCS Science Learning, USA

Emily Harris, BSCS Science Learning, USA

Strand 7: Pre-service Science Teacher Education

Indonesian Preservice Science Teacher's Learning of Integrated

STEM Teacher Identity: Single Case Study

Anjar Putro Utomo*, University of Minnesota, USA

Gillian Roehrig, University of Minnesota, USA

Strand 7: Pre-service Science Teacher Education Roundtable

Examining the Intersection of Culture and Positional Identities on an Elementary Preservice Teacher's Identity Development

Jenna Gist*, Purdue University, USA

Jeffrey Radloff*, State University of New York- Cortland, USA

Brenda Capobianco, Purdue University, USA

Strand 7: Pre-service Science Teacher Education Roundtable

STEM Teacher Persistence: Teacher Preparation Programs that Support Identity and Belonging

Danielle Sodani*, American University, USA

Peter Locher, American University, USA

Sarah Irvine Belson, American University, USA

Carolyn Parker, American University, USA

Shari Watkins, American University, USA

Kiho Kim, American University, USA

Strand 8: In-service Science Teacher Education

WIP Roundtable

Lichen Our Way to Better Data Literacy: Insights from a Place-Based and Bayesian Professional Development

Amanda Garner*, University of Tennessee, USA

Joshua Rosenberg, University of Tennessee, USA

Strand 8: In-service Science Teacher Education

WIP Roundtable

Exploring Teacher Professional Development for Civic Science Education in Middle Grades

Maggie Demarse*, Michigan State University, USA

Strand 8: In-service Science Teacher Education

WIP Roundtable

Mechanisms of Professional Learning for 3D Science Teaching in Rural Schools

Rebecca Sansom*, Texas A&M University, USA

Michelle Hudson, Brigham Young University, USA

Heather Leary, Brigham Young University, USA

Clara Smith, Brigham Young University, USA

Max Longhurst, Utah State University, USA

Josh Stowers, Brigham Young University, USA

Strand 8: In-service Science Teacher Education

WIP Roundtable

Empowering In-Service Middle School Teachers to Integrate Quantum Science: A Design-Based Approach to K-12 Curriculum

Zeynep Akdemir-Beveridge*, University of Connecticut, USA

Muhsin Menekse, Purdue University, USA

Strand 8: In-service Science Teacher Education Roundtable

Exploring a teacher-researcher collaboration: the inside-out of the social phenomenon

Maiza de Albuquerque Trigo*, University of Luxembourg, Luxembourg

Thierry Frentz*, Ministry of Education, Luxembourg

Strand 11: Cultural, Social, and Gender Issues Roundtable

Motherhood in academia: An autoethnography examining motherly guilt

Andrea Phillips*, Indiana University, USA

Claire Cesljarev, Indiana University, USA

Strand 11: Cultural, Social, and Gender Issues Roundtable

Mapping Gender Dynamics in STEM: A scoping review of the MENA region

Aya Elkholy, Elite International School, Egypt

Heba EL-Deghaidy*, American University in Cairo, Egypt

Zahra almasabi, Najran University, Saudi Arabia

Strand 11: Cultural, Social, and Gender Issues Roundtable

The Use of Science-Related Cultural Capital among Latina Engineers

Emily Tancredi-Brice Agbenyega*, LaGuardia Community College, USA

Strand 11: Cultural, Social, and Gender Issues

WIP Roundtable

Gendered experiences of impostor phenomenon: A qualitative study in STEM.

Devasmita Chakraverty*, Indian Institute of Management Ahmedabad, India

Strand 11: Cultural, Social, and Gender Issues

WIP Roundtable

Including Families as a Way to Expand STEM Identity Research

Marisa Peczuh*, University of Minnesota, USA

Keisha Varma, University of Minnesota, USA

Strand 12: Technology for Teaching, Learning, and Research

Roundtable

Exploring the role of GAI-assisted argumentative debate in cultivating engineering undergraduate students' critical thinking skills

Hongyu Peng, School of Education, Shanghai Jiao Tong University, China

Jiexiu Chen, School of Education, Shanghai Jiao Tong University, China

Strand 12: Technology for Teaching, Learning, and Research

Roundtable

Exploring Middle Schoolers' Learning in an AI-Integrated Paleontology Camp through Individual and Group ZPD

Chih Hsuan Lin*, University of Florida, USA

Tonika Jones, University of Florida, USA

Ray Opoku, University of Florida, USA

Gabriella Haire, University of Florida, USA

Christine Wusylko*, University of Florida, USA

Nazanin Adhami*, University of Florida,
USA

Bruce MacFadden, University of Florida,
USA

Victor Perez, St. Mary's College of
Maryland, USA

Brian Abramowitz, University of Florida,
USA

Pavlo Antonenko, University of Florida,
USA

**Strand 12: Technology for Teaching,
Learning, and Research
Roundtable**

*Optimizing Deep Learning
Frameworks and Large Language
Models for Automated Science
Classroom Discourse Analysis*
Soon Lee*, Kennesaw State University, USA

**Strand 12: Technology for Teaching,
Learning, and Research
Roundtable**

*Bridging Gaps in Science Education:
AI-Driven Personalized Learning and
Equity*

Taesoo An*, Seoul National University,
Korea, Republic of

Sonya Martin, Seoul National University,
Korea, Republic of

**Strand 12: Technology for Teaching,
Learning, and Research
Roundtable**

*Preservice teachers' perceptions of
utilizing AI in science education with a
focus on human-centered approaches*

Soo Won Shim*, Illinois State University,
USA

Jeongae Kang, Illinois State University,
USA

Do-Yong Park, Illinois State University,
USA

**Strand 12: Technology for Teaching,
Learning, and Research**

Roundtable

*Generative AI in Science Teacher
Education*

Stephanie Arthur*, University of South
Florida, USA

Yvonne Franco, University of Tampa, USA
Zafer Unal, University of South Florida,
USA

**Strand 5: College Science Teaching and
Learning (Grades 13-20)**

WIP Roundtable

*Investigation of the Inter-Rater
Reliability between ChatGPT-4o and
Human Raters in Qualitative Analysis.*

Nikhil Borse*, Purdue University, USA
Ravishankar Chatta Subramaniam,
Purdue University, USA

N. Sanjay Rebello, Purdue University, USA

**Strand 14: Environmental Education and
Sustainability**

WIP Roundtable

*Culturally-Relevant Field Ecology:
Wildfire Mitigation and Social-
Ecological Systems Resilience in Maui,
Hawai'i*

Jadda Miller*, University of California,
Davis, USA

Heidi Ballard, University of California,
Davis, USA

Cassie Kepler, Kihei Charter School, USA

**Strand 14: Environmental Education and
Sustainability**

WIP Roundtable

*Narratives as a Means for Fostering
Agency and Making Sense of Climate
Change Challenges*

Giulia Tasquier*, ALMA MATER
STUDIORUM - University of Bologna, Italy
Erik Knain, University of Oslo, Norway

Alfredo Knain, University of Gerona, Spain

Hanna Rokenes, University of Oslo,
Norway

**Strand 14: Environmental Education and
Sustainability
Roundtable**

*Transformative learning experience:
Measurable outcome of a place-based
environmental justice-oriented
geoscience curriculum*

Shondricka Burrell*, Morgan State
University, USA

Keshiyena Pieters, Morgan State
University, USA

**Strand 14: Environmental Education and
Sustainability**

WIP Roundtable

*Development of an instrument to
measure grade 7 students' climate
change knowledge and GIS skills*

Marie Johanna Univer*, University of Tartu,
Estonia

Regina Soobard, University of Tartu,
Estonia

Birgit Viru, University of Tartu, Estonia

**Strand 14: Environmental Education and
Sustainability
Roundtable**

*Needs Assessment for Leveraging
Participatory Science to Enhance
Participation in Conservation in the
Amazon*

MARTHA SIMON-PARDO*, UNIVERSITY OF
FLORIDA, USA

JULIE BROWN*, UNIVERSITY OF FLORIDA,
USA

**Strand 13: History, Philosophy, Sociology,
and Nature of Science**

Roundtable

*How Expressed Distrust in Scientists
Impacts Individual Behavior*

Ava Breitbeck*, Syracuse University, USA

**Understanding How Learners Seek
Coherence in Science**

**Strand 1: Science Learning: Development
of student understanding**

25-Mar-25, 10:00 AM-11:30 AM

Location: Annapolis 2

Symposium

*Symposium: Understanding How
Learners Seek Coherence in Science*

Engin Bumbacher, Haute École
Pédagogique Vaud, Switzerland

Benjamin Geller, Swarthmore College,
USA

Katherine Gifford, University of Illinois
Urbana-Champaign, USA

Karen Hammerness, American Museum
of Natural History, USA

Eric Kuo, University of Illinois Urbana-
Champaign, USA

Caroline Long, University of Washington,
USA

Kavita Matsko, Northwestern University,
USA

Mary Short, Smithsonian Science
Education Center, USA

Tiffany-Rose Sikorski, The George
Washington University, USA

David Stroupe, University of Utah, USA

Daniel Levin, University of Maryland,
College Park, USA

**Empowering Science Educators:
Support Systems, Mentorship, and
Professional Development Strategies**
**Strand 2: Science Learning: Contexts,
Characteristics and Interactions**
25-Mar-25, 10:00 AM-11:30 AM
Location: Annapolis 1

Stand-Alone Paper

*Harnessing Personal Storytelling to
Support Teachers' Initial Grasp of
Understanding Computational
Thinking*

Khusbu Dalal*, University of Maryland, USA
Jennifer Radoff, University of Maryland,
USA
Andrew Elby, University of Maryland, USA
Amy Green, University of Maryland, USA

Stand-Alone Paper

*Catalyst for Change: Validating a
Support-Seeking Instrument for
Science Teachers*

Mayra Marquez-Mendez*, University of
Nevada Las Vegas, USA
Tina Vo, University of Nevada Las Vegas,
USA
Adjoa Mensah, University of Nevada Las
Vegas, USA

Stand-Alone Paper

*Prioritizing Expectations Through
Professional Development on
Mentorship for Physics
Undergraduate Research*

Heather McCall*, University of Kentucky,
USA
Cameron Richards*, University of
Kentucky, USA
Jennifer Wilhelm, University of Kentucky,
USA

Stand-Alone Paper

*Working towards a Rightful Presence
for minoritized teacher, student and
parent in middle school engineering*
Virginia Swindell*, University of North
Carolina at Greensboro, USA

Edna Tan, University of North Carolina at
Greensboro, USA

**Integrating cultural relevance and
social justice to improve learning
outcomes and promote inclusivity**

**Strand 4: Science Teaching — Middle and
High School (Grades 5-12): Characteristics
and Strategies**

25-Mar-25, 10:00 AM-11:30 AM
Location: Baltimore 4

Stand-Alone Paper

*Teacher Perceptions of Enacting a
Lesson Woven with Choctaw Culture
and Place*

Stephanie Hathcock*, Oklahoma State
University, USA
Juliana Utley, Oklahoma State University,
USA
Kathryn Gardner-Vandy, Oklahoma State
University, USA
Sarah McDowell, Maryville College, USA
Angela Just, Oklahoma State University,
USA
Kirtika Panwar, Oklahoma State
University, USA

Stand-Alone Paper

*Breaking Down Barriers: Effects of
Culturo-Techno-Contextual Approach
on Learning Difficult Computer
Studies Concepts*

Esther Peter, Africa Centre of Excellence for Innovative and Transformative STEM Education, Lagos State University, Nigeria
David Peter, Lagos State University, Nigeria
Peter Okebukola, Lagos State University, Nigeria
Deborah Agbanimu, National Open University, Nigeria
Franklin Onowugbeda, Lagos State University, Nigeria
Adekunle Oladejo, Lagos State University, Nigeria
Olasunkanmi Gbeleyi, Lagos State University, Nigeria

Collaboration and Interdisciplinary Research

Strand 5: College Science Teaching and Learning (Grades 13-20)
25-Mar-25, 10:00 AM-11:30 AM
Location: Magnolia 3

Stand-Alone Paper

Developing future leaders: Interdisciplinary and professional training for graduate students in Food-Energy-Water (FEW) systems
Suhana Chattopadhyay*, University of Maryland, USA
Katya Murillo, University of Maryland, USA
Gili Ad-Marbach*, University of Maryland, USA
Amy Sapkota, University of Maryland, USA

Stand-Alone Paper

Experiences of Collaboration Difficulties in University STEM Laboratories: A Phenomenological Study
Sun Young Shin*, Seoul National University, Korea, Republic of

Seung Ah Park, Seoul National University, Korea, Republic of
Minsu Ha, Seoul National University, Korea, Republic of

Stand-Alone Paper

Students' Ideas about Convergence Research in a Complex Problems Course on Wasted Food
Alicia DeBruin, American University, USA
Hannah Jardine*, American University, USA

Stand-Alone Paper

'My field is packed full of jargon.' How Graduate Students Navigate a Convergence Research Center
Kathleen Bordewieck*, North Carolina State University, USA
M. Gail Jones, North Carolina State University, USA

Building Youths' STEM Identity through Informal Science Experiences

Strand 6: Science Learning in Informal Contexts
25-Mar-25, 10:00 AM-11:30 AM
Location: Magnolia 2

Stand-Alone Paper

The social networks of historically marginalized youth and how they contribute to their STEM pathways.
Preeti Gupta*, American Museum of Natural History, USA
Peter Bjorklund, University of California San Diego, USA
Rachel Chaffee*, American Museum of Natural History, USA

Anna Macpherson*, American Museum of Natural History, USA
Mahmoud Abouelkheir*, American Museum of Natural History, USA
Coral Braverman, American Museum of Natural History, USA
Jahneal Francis, American Museum of Natural History, USA
Lois Wu, American Museum of Natural History, USA
Lucie Lagodich, American Museum of Natural History, USA
Priya Hinton, American Museum of Natural History, USA

Stand-Alone Paper

Problem-Solving in the Missouri Ozarks: Case Studies in Informal Education to Promote Science Interest
Katherine Sharp*, Missouri University of Science and Technology, USA
Beth Kania-Gosche, Missouri University of Science and Technology, USA
Carly Carron, Missouri University of Science and Technology, USA

Stand-Alone Paper

Fostering Belonging in a STEM Academic Community of Practice through a Summer Research Internship
Alexandria Muller*, University of California, Santa Barbara, USA
Jeanice Trat, University of California, Santa Barbara, USA
Wendy Ibsen, University of California, Santa Barbara, USA

Stand-Alone Paper

Belonging and Connections: A Network Analysis of High School Students in a Science-Centered College-Readiness Program

Rachelle Pedersen*, Texas Tech University, USA
Emily Sparago*, Boston University School of Medicine, USA
Cindy Kern*, Quinnipiac University, USA

Research in Approaches to STEM Teacher preparation

Strand 7: Pre-service Science Teacher Education
25-Mar-25, 10:00 AM-11:30 AM
Location: Baltimore 2

Stand-Alone Paper

Overcoming Barriers in Interdisciplinary Education: Exploring Pre-Service Teachers' Perceptions
Niklas Kramer*, Bielefeld University, Germany
Claas Wegner, Bielefeld University, Germany

Stand-Alone Paper

Innovating Science Education: The Impact of Situated Learning on Preservice Teachers' Implementation of Engineering Design
John Ojeogwu*, Texas State University, USA
Frackson Mumba, University of Virginia, USA

Stand-Alone Paper

Elementary Preservice Teachers' Views of Investigations: A Pre/post Comparison from a Science Content Course
Ashley Thomas, Kennesaw State University, USA
Rasheda Likely, Kennesaw State University, USA

Preethi Titu, Kennesaw State University,
USA
Anna Arias, Kennesaw State University,
USA
Jessica Stephenson Reaves, Kennesaw
State University, USA
Soon Lee, Kennesaw State University, USA

**Shaping Teacher Dispositions:
Insights from Preservice Learning
Experiences**

**Strand 7: Pre-service Science Teacher
Education**

25-Mar-25, 10:00 AM-11:30 AM

Location: Baltimore 1

Stand-Alone Paper

*Elementary Pre-service Teachers'
Responsiveness When Facilitating
Simulated Scientific Argumentation
Discussions: Before and After an
Intervention*

Shreyashi Halder*, ETS, USA

Jamie Mikeska, ETS, USA

Devon Kinsey, ETS, USA

Pamela Lottero-Perdue, Towson
University, USA

Pavneet Bharaj, California State University
Bakersfield, USA

Stand-Alone Paper

*Connections between collective,
personal, and enacted pedagogical
content knowledge in a pre-service
chemistry teacher program*

Luciane Goes, Federal University of Sao
Carlos, Brazil

Carmen Fernandez*, University of Sao
Paulo, Brazil

Stand-Alone Paper

*Learning Dispositions of Pre-Service
Biology Teachers and Undergraduate
Biology Students regarding Animal
Experimentation in Research*

Jacqueline Dischereit*, Georg-August-
University, Germany

Susanne Bögeholz, Georg-August-
University, Germany

Stand-Alone Paper

*How a Course Exploring AI Tools
Influences Pre-service Teacher's
Perceptions of AI*

Kerry Bartlett*, University of North
Carolina at Chapel Hill, USA

Janice Anderson, University of North
Carolina at Chapel Hill, USA

**Challenges and Resilience in Early
Career Science Teacher Retention**

**Strand 8: In-service Science Teacher
Education**

25-Mar-25, 10:00 AM-11:30 AM

Location: Camellia 2

Stand-Alone Paper

*Newly Hired Science Teachers
Cultivating Resilience: Proximal
Assessments and Distal Reflections*
Jose Pavez*, Western Illinois University,
USA

Ella Yonai, University of Georgia, USA

Shannon Navy, Kent State University, USA

Julie Luft, University of Georgia, USA

Adepeju Prince, University of Georgia, USA

Lisa Borgerding, Kent State University,
USA

Robert Idsardi, Eastern Washington
University, USA

Challenges and Resilience in Early Career Science Teacher Retention

Strand 8: In-service Science Teacher Education

25-Mar-25, 10:00 AM-11:30 AM

Location: Camellia 2

Stand-Alone Paper

Engaging out-of-field teachers as learners: when is it too much?

David Perl-Nussbaum*, Weizmann Institute of Science, Israel

Dana Vedder-Weiss, Ben-Gurion University of the Negev, Israel

Edit Yerushalmi, Weizmann Institute of Science, Israel

Stand-Alone Paper

Early Career STEM Teacher Burnout: Trends and Explanations

Shannon Navy*, Kent State University, USA

Ella Yonai*, University of Georgia, USA

Adepeju Prince, Kent State University, USA

Stand-Alone Paper

Does Remuneration and Recognition Matter in Attrition? Science Teachers' Experiences in the Teacher Incentive Allotment

Rebecca Hite*, Texas Tech University, USA

Gina Childers*, Texas Tech University, USA

Jessica Gottlieb, Texas Tech University, USA

Alexander Wiseman, Texas Tech University, USA

Strengthening Science Teaching through Mentoring, Modeling, and Professional Development

Strand 8: In-service Science Teacher Education

25-Mar-25, 10:00 AM-11:30 AM

Location: Annapolis 3

Stand-Alone Paper

Science Teachers and District Science Leaders: A Complex Pragmatic Study of Support and Instruction

Julie Luft*, University of Georgia, USA

Joseph Deluca, University of Georgia, USA

Yuxi Huang, University of California, USA

Xinyu He, University of Georgia, USA

Elizabeth Ayano, University of Georgia, USA

Ella Yonai, University of Georgia, USA

Brooke Whitworth, Clemson University, USA

Stand-Alone Paper

Teachers' Professional Development Based on Learning Progression for Metamodelling and Modeling Practice

Yi-Xuan Liu*, Beijing Normal University, China

Xin-Hao Song, Beijing Normal University, China

Jian-Xin Yao, Beijing Normal University, China

Stand-Alone Paper

Putting it to Practice: Exploring the Practical Implementation of Educative Mentoring Concepts

Amanda Hall*, North Carolina State University, USA

Soonhye Park, North Carolina State University, USA

Stand-Alone Paper

Investigating Cross-Grade Discussions around Science Teaching Practice in Vertical Professional Learning Communities

Jose Felipe Martinez, UCLA, USA

Matthew Kloser*, University of Notre Dame, USA

Michael Szopiak, University of Notre Dame, USA

Marlene Saint Martin Guerra, UCLA, USA

Justin Betzelberger, UCLA, USA

Richard Huyn, UCLA, USA

Interdisciplinary and STEM learning Pathways

Strand 10: Curriculum and Assessment

25-Mar-25, 10:00 AM-11:30 AM

Location: Magnolia 1

Stand-Alone Paper

Effects of C-STEM projects on high school students' interest in STEM careers

Ning Wang, Shaanxi Normal University, China

Weiping Hu, Shaanxi Normal University, China

Stand-Alone Paper

Developing and Validating the Interdisciplinary Science Assessment of Carbon Cycling II

Hyesun You*, The University of Iowa, USA

Sunyoung Park,

sunyoungpark@callutheran.edu, USA

Soo Hyun Yang*, The University of Texas at Austin, USA

Stand-Alone Paper

Advancing Ultra-Orthodox and Religious Male Students through Interdisciplinary Practical Engineering Program

Ruth Edri*, Technion - Israel institute of technology, Israel

Shahaf Rocher-Yoel, Technion - Israel institute of technology, Israel

Yehudit Dori, Technion - Israel institute of technology, Israel

Stand-Alone Paper

Developing and Evaluating an Online Biomedical Curriculum on Blood Disorders for High School Students

Tingting Yang*, St. Jude Children's Research Hospital, USA

Amanda Etherington*, St. Jude Children's Research Hospital, USA

Torrean Johnson, St. Jude Children's Research Hospital, USA

Kyle Bichsel, St. Jude Children's Research Hospital, USA

Robyn Pennella, St. Jude Children's Research Hospital, USA

Eric Rivera-Peraza, St. Jude Children's Research Hospital, USA

Katherine Ayers, St. Jude Children's Research Hospital, USA

Misinformation in Science Media - Enhancing the Evaluation of Credibility in Digital Contexts
Strand 12: Technology for Teaching, Learning, and Research
25-Mar-25, 10:00 AM-11:30 AM
Location: Baltimore 5

Symposium

'Misinformation in Science Media' - *Enhancing the Evaluation of Credibility in Digital Contexts*
Kerstin Kremer*, Justus Liebig University, Germany
Alexander Büsing*, Technische Universität Braunschweig, Germany
Andreas Nehring*, Leibniz University Hanover, Germany
Soraya Kresin*, Technische Universität Braunschweig, Germany
Margot Bakker, Technische Universität Braunschweig, Germany
Daniel Pimentel*, The University of Alabama, USA
Ayelet Baram-Tsabari, Technion – Israel Institute of Technology, Israel
Shakked Dabran-Zivan*, Technion – Israel Institute of Technology, Israel
Lisa Selent, Leibniz University Hanover, Germany
Catharina Pfeiffer, Leibniz University, Germany
Stefanie Lenzer, IPN - Leibniz Institute for Science and Mathematics Education, Germany
Jonathan Osborne, Stanford University, USA
Douglas Allchin, University of Minnesota, USA

Affordances, Imagination, and Learner Agency
Strand 13: History, Philosophy, Sociology, and Nature of Science
25-Mar-25, 10:00 AM-11:30 AM
Location: Camellia 1

Stand-Alone Paper

Affordances of citizen science for developing student understanding of the nature of science
Zoubeida Dagher*, University of Delaware, USA

Stand-Alone Paper

Scientific Imagination and Scientific Modeling
Amy Farris*, Penn State University, USA

Stand-Alone Paper

Agential Variation Theory: Towards a Post-humanist Performative Framework for Research on Students Learning with Representations
Song Wang*, California State University - Dominguez Hills, USA
Stanley Lo, University of California, San Diego, USA
Thomas Bussey, University of California, San Diego, USA

Environment and Citizenship
Strand 14: Environmental Education and Sustainability
25-Mar-25, 10:00 AM-11:30 AM
Location: Baltimore 3

Stand-Alone Paper

Sustainability Citizenship: A European-wide Professional Development vision
Franz Bogner*, University of Bayreuth, Germany

Sofoklis Sotiriou, Ellinogermaniki Agogi, Greece

Stand-Alone Paper

Which factors affect the implementation of Citizen Science in school science classrooms?

Michelle Müller*, Leibniz University Hannover, Germany

Vanessa van den Bogaert, Leibniz University Hannover, Germany

Malte Foss-Jähn, Leibniz University Hannover, Germany

Pauline Klein, RWTH Aachen University, Germany

Julia Lorke, RWTH Aachen University, Germany

Till Bruckermann, Leibniz University Hannover, Germany

Stand-Alone Paper

Fostering Socioscientific Reasoning, Global Citizenship, and Cooperation in Teacher Candidates through Inter-University and Place-Based Collaboration

Banu Avsar Erumit, Recep Tayyip Erdogan University, Turkey

Arzu Tanis Ozcelik*, Aydin Adnan Menderes University, Turkey

Stand-Alone Paper

Environmental Ethos: How Civic Knowledge, Self-Efficacy, and Digital Media Shape Students' Pro-Environmental Actions

Tyler Hansen, Utah State University, USA

Chloe Taylor, Utah State University, USA

Ryan Knowles, Utah State University, USA

Sustainability education with teachers: Collaborating to support teachers, communities, and children, towards critical, visionary future-making

Strand 14: Environmental Education and Sustainability

25-Mar-25, 10:00 AM-11:30 AM

Location: Annapolis 4

Symposium

Sustainability education with teachers: Collaborating to support teachers, communities, and children, towards critical, visionary future-making

Heather Schurman, Université de Montréal, Canada

Jrène Rahm, Université de Montréal, Canada

Ayça Fackler, University of Missouri, USA

Cecilia Poon, Brooklyn College, CUNY, USA

Pieranna Pieroni, Brooklyn College, CUNY, USA

Theila Smith, Brooklyn College, USA

Christina Siry, University of Luxembourg, Luxembourg

Doriana Sportelli, University of Luxembourg, Luxembourg

Patricia Muller, École fondamentale de Beaufort, Luxembourg

Sara Wilmes, University of Luxembourg, Luxembourg

Exploring the Interplay between Educational Data and Current or Future Science Educational Policy
Strand 15: Policy, Reform, and Program Evaluation

25-Mar-25, 10:00 AM-11:30 AM

Location: Azalea 3

Stand-Alone Paper

Public Opinion About Teacher Salaries: Does it Pay to be a Male Science Teacher?

Eugene Judson, Arizona State University, USA

Mohammed Ibrahim*, Arizona State University, USA

Stand-Alone Paper

Consistent and Comparable Educational Data: Returning to School During the COVID-19 Era

Molly Weinburgh*, Texas Christian University, USA

Melissa Demetrikopoulos, Institute of Biomedical Philosophy, USA

John Pecore, University of West Florida, USA

Zhan Shi, Texas Christian University, USA

Daniella Biffi, Texas Christian University, USA

Dean Williams, Texas Christian University, USA

Stand-Alone Paper

Policy Analysis of Middle School Science Acceleration and High School Science Outcomes

Jon Steigerwald, Stony Brook University, USA

Angela Kelly, Stony Brook University, USA

Stand-Alone Paper

The million learning minutes yardstick: comparing educational modalities using a time metric

Yuval Rosenberg*, Weizmann Institute of Science, Israel

Asaf Salman, Weizmann Institute of Science, Israel

Yossi Elran, Weizmann Institute of Science, Israel

Giora Alexandron, Weizmann Institute of Science, Israel

Ron Milo, Weizmann Institute of Science, Israel

Strand Meetings

25-Mar-25, 11:30 AM-12:45 PM

Strand 1: Meet with Strand Coordinators

Location: Annapolis 2

Strand 2: Meet with Strand Coordinators

Location: Annapolis 1

Strand 3: Meet with Strand Coordinators

Location: Baltimore 2

Strand 4: Meet with Strand Coordinators

Location: Baltimore 4

Strand 5: Meet with Strand Coordinators

Location: Magnolia 3

Strand 6: Meet with Strand Coordinators

Location: Magnolia 2

Strand 7: Meet with Strand Coordinators

Location: Cherry Blossom Terrace

Strand 8: Meet with Strand Coordinators

Location: Annapolis 3

Strand 10: Meet with Strand Coordinators

Location: Magnolia 1

Strand 11: Meet with Strand Coordinators

Location: Azalea 1

Strand 12: Meet with Strand Coordinators

Location: Baltimore 5

Strand 13: Meet with Strand Coordinators

Location: Camellia 1

Strand 14: Meet with Strand Coordinators

Location: Baltimore 3

Strand 15: Meet with Strand Coordinators

Location: Azalea 3

**A Celebration of Outstanding
Doctoral Research Award Recipients,
Early Career Award Recipients and
new NARST Fellows: A Discussion of
the Future of Science Education**
25-Mar-25, 12:45 PM-2:15 PM
Location: Azalea 2

Administrative Session

Organizer

Amelia Gotwals, Michigan State University,
USA

Panelists

Bridget Miller, University of South
Carolina, USA

David Owens, University of Montana, USA

Enrique Suárez, University of
Massachusetts, Amherst, USA

**Designing for Equitable Futures:
Perspectives on Rebuilding and
Healing in the Next Century of
Teaching and Learning**

25-Mar-25, 12:45 PM-2:15 PM

Location: Annapolis 4

Administrative Session

Organizers

Khanh Tran, Purdue University, West
Lafayette, USA

Maria Maulucci, Barnard College, USA

Justice Walker, The University of Texas at
El Paso, USA

Presenter

Tia Madkins, The University of Texas at
Austin, USA

**Empowering Asian and Pacific
Islanders through Science Teaching
and Learning for Public Good**
25-Mar-25, 12:45 PM-2:15 PM
Location: Annapolis 2

Administrative Session

Organizers

Hosun Kang, University of Irvine California,
Irvine, USA

Edna Tan, University of North Carolina at
Greensboro, USA

Panelists

Johan Tabora, University of Illinois at
Chicago, USA

Maria Varelas, University of Illinois at
Chicago, USA

Anil Challa, University of Alabama,
Tuscaloosa, USA

Meena Balgopal, Colorado State
University, Fort Collins, USA

Bevo Wahono, University of Jember,
Indonesia

Erlia Narulita, University of Jember,
Indonesia

Anjar Utomo, University of Jember,
Indonesia

Troy Sadler, University of North Caroline at
Chapel Hill, USA

**Contextualizing Science Education:
Cognitive, Affective, and Personal
Dimensions in Learning Science**

**Strand 1: Science Learning: Development
of student understanding**

25-Mar-25, 12:45 PM-2:15 PM

Location: Camellia 2

Stand-Alone Paper

*The progressive construction of
personally-inflected sense-making*

Sara Satanassi*, Department of Physics
and Astronomy, University of Bologna, Italy

Olivia Levrini, Department of Physics and Astronomy, University of Bologna, Italy

Stand-Alone Paper

Taking a Socio-Political Turn in Genetics Education
Ravit Duncan, Rutgers University, USA
Dalia Hassan*, Rutgers University, USA
Rishi Krishnamoorthy, University of Toronto, Canada
Na'ama Av-Shalom, Rutgers University, USA

Stand-Alone Paper

Mental Models of the Earth's Internal Structure in Primary and Middle School Students in Chile
Claudia Vergara*, Alberto Hurtado University, Chile
Kassandra Navarrete*, Alberto Hurtado University, Chile
Carolina Parraguez*, Pontificia Universidad Católica de Valparaíso, Chile
Hernan Cofre, Pontificia Universidad Católica de Valparaíso, Chile
Paola Nuñez, Pontificia Universidad Católica de Valparaíso, Chile

Stand-Alone Paper

Does Context Matter? A Meta-Analysis of Contextualized Science Learning Research
Michael Giamellaro*, Oregon State University, USA
Joseph Taylor, University of Colorado, USA
Kathryn Watson, University of Iowa, USA
Amanda Morrison, Oregon State University, USA

Stand-Alone Paper

An Emerging Theory of School-Based Citizen Science
Patrick Smith*, Horizon Research, Inc., USA

Christine Goforth*, North Carolina Museum of Natural Sciences, USA

Sarah Carrier*, NC State University, USA
Meredith Hayes, Independent Researcher, USA
Sarah Safley, Horizon Research, Inc., USA
Danielle Scharen*, Horizon Research, Inc., USA

Stand-Alone Paper

Exploring Students' Epistemic Uncertainties in the Context of Socioscientific Issues
Anil Yurdakul, Marmara University, Turkey
Cigdem Han Tosunoglu*, Marmara University, Turkey

Stand-Alone Paper

Empowering Students through Open Schooling: Educational Seismology's Impact on Civic Responsibility and Science Learning Views
Yvoni Pavlou*, University of Cyprus, Cyprus
Marios Papaevripidou, University of Cyprus, Cyprus
Zacharias Zacharia, University of Cyprus, Cyprus
Gregory Milopoulos, Research and Development Department, Ellinogermaiki Agogi, Greece
Sofoklis Sotiriou, Research and Development Department, Ellinogermaiki Agogi, Greece
Gerasimos Chouliaras, Institute of Geodynamics, National Observatory of Athens, Greece

Using inclusive, responsive teaching practices in diverse science classroom settings

Strand 4: Science Teaching — Middle and High School (Grades 5-12): Characteristics and Strategies

25-Mar-25, 12:45 PM-2:15 PM

Location: Baltimore 4

Stand-Alone Paper

English Learners' Use of Home Language in a Science Classroom

Rebecca Robertson, University of Minnesota, USA

Preethi Titu*, Kennesaw State University, USA

Felicia Dawn Tibayan Leammukda*, St. Cloud State University, USA

Stand-Alone Paper

Refined Consensus Model for the teaching population who works with deaf students

Scott Cohen*, Georgia State University, USA

Patrick Enderle, Georgia State University, USA

Jessica Scott, Georgia State University, USA

Stand-Alone Paper

Moving away from "very cold and detached" teaching: In-Service Secondary Science Teachers of Emergent Bilinguals

Jorge Solis*, UT San Antonio, USA

Kristen Lindahl, UT San Antonio, USA

Bedrettin Yazan, UT San Antonio, USA

Michael Mauricio*, UT San Antonio, USA

Caryn Calisi, UT San Antonio, USA

Exploring Cognitive and Interpretive Processes in Undergraduate STEM Education

Strand 5: College Science Teaching and Learning (Grades 13-20)

25-Mar-25, 12:45 PM-2:15 PM

Location: Magnolia 3

Stand-Alone Paper

A Study Of Undergraduate Students Interpretations Of Tree-Thinking Using Eye Movements

Mallika Saha*, Texas State University, USA

Daniel Ferguson, Texas State University, USA

Kristy Daniel, Texas State University, USA

Stand-Alone Paper

Exploring Meaning-Making in Undergraduate Human Anatomy and Physiology: Role of Drawing and Representation Construction

Sarah Hajama, Macquarie University, Australia

Hye-Eun Chu*, Macquarie University, Australia

Stand-Alone Paper

Student Learning, Perceptions of Learning, and Perceptions of a Flipped College Physiology Classroom

Elizabeth Stansberry*, Pepperdine University, USA

Krista Lucas*, Pepperdine University, USA

Rachel Tan, Pepperdine University, USA

Stand-Alone Paper

Individual differences in dispositions toward scientific uncertainty navigation during problem-based learning in cybersecurity education

Jongchan Park*, Arizona State university, USA

Ying-Chih Chen, Arizona State university,
USA

Garima Agrawal, Arizona State university,
USA

Yuli Deng, Arizona State university, USA
Huan Liu, Arizona State university, USA

STEM Partnerships, Interactions, and Learning in Museum Spaces

Strand 6: Science Learning in Informal Contexts

25-Mar-25, 12:45 PM-2:15 PM

Location: Magnolia 2

Stand-Alone Paper

The importance of knotworking in forming successful STEM partnerships

Eleanor Kenimer*, Michigan State University, USA

Roberta Hunter, New Jersey Audobon, USA

Gail Richmond*, Michigan State University, USA

Stand-Alone Paper

Using Natural History Museums as Professional Development for Elementary Teachers

Megan Ennes*, University of Florida, USA

Brian Abramowitz, University of Florida, USA

Melanie Ciangreco, University of Florida, USA

Sadie Mills, University of Florida, USA

Stand-Alone Paper

Towards mindfulness: A Brazilian case study of a science museums response to the COVID-19 pandemic

Ana Maria Navas Iannini, Simon Fraser University, Canada

Karine Fernandes*, Simon Fraser University, Canada

Erminia Pedretti, University of Toronto, Canada

Exploring equity and Reflective practice to support teaching and learning

Strand 7: Pre-service Science Teacher Education

25-Mar-25, 12:45 PM-2:15 PM

Location: Baltimore 1

Stand-Alone Paper

Pre-Service Teachers' Views on Oral Presentations Assessments: The Influence of Social and Emotional Experiences.

Neha Anand*, Midway University, USA

Ella Yonai, University of Georgia, USA

Stand-Alone Paper

Supporting early career science teachers: Reflections from a mentoring initiative

Robbie Higdon*, James Madison University, USA

Stand-Alone Paper

Bridging Perspectives in Preservice Teacher Education: Exploring Ontological Pluralism for Critical Engagement, Inclusively, and Sustainability

Amy Green*, University of Maryland, USA

Angela Stoltz, University of Maryland, USA

Stand-Alone Paper

Exploring How Equity Perceptions Are Manifested in Preservice Teachers' Practices in Elementary Science Methods Course

Wanjoo Ahn*, Michigan State University, USA

Christina Schwarz, Michigan State University, USA

Evolving Pedagogical Content Knowledge in Science Teaching Strand 8: In-service Science Teacher Education
25-Mar-25, 12:45 PM-2:15 PM
Location: Annapolis 3

Stand-Alone Paper

Pedagogical Content Knowledge of Climate Change in a biology teacher: A longitudinal case study

Catalina Cañete*, Pontificia Universidad Católica de Valparaíso, Chile
Hernan Cofré*, Pontificia Universidad Católica de Valparaíso, Chile

Stand-Alone Paper

Comparing science teacher sensemaking of complex genetics using different phenomena.

Sara Porter*, University of North Carolina at Greensboro, USA
Hilleary Osherooff, Exploratorium, USA

Stand-Alone Paper

Unpacking Teacher Content Knowledge Development: The Impact of Teaching Experience and Influential Factors

Ryan Nixon*, Brigham Young University, USA
Stefan Sorge*, Leibniz Institute for Science and Mathematics Education, Germany
Hannah Dudley, Brigham Young University, USA
Alexys Skidmore, Brigham Young University, USA

Stand-Alone Paper

Understanding the Complexity of Adaptive Teaching Expertise in Advancing Knowledge Generation in Elementary Science

Jale Ercan Dursun*, The University of Alabama, USA
Jee Kyung Suh, The University of Alabama, USA
Brian Hand, The University of Iowa, USA

Understanding and Appreciating How Science Teachers Reflect Student and Community Voices through Thematic Curricula

Strand 10: Curriculum and Assessment
25-Mar-25, 12:45 PM-2:15 PM
Location: Magnolia 1

Related Paper Set

Reclaiming the "Community" in Community Colleges: A Social Justice Approach to the Biology Curriculum
Marcela Bernal-Munera*, Malcolm X College, USA

Related Paper Set

We Don't Have to Reinvent the Wheel: Repurposing Learning for Ruptures in Restrictive Science Spaces
Diana Bonilla*, Northern Illinois University, USA

Related Paper Set

Negotiating Contesting Notions of Equity in Educational Policy to Co-Design Transdisciplinary Science Curriculum
Daniel Morales-Doyle*, University of Illinois, USA

Tomasz Rajski, Chicago Public Schools,
USA

Related Paper Set

The Woven Copresence of Students in Transformative Science Teachers' Reflections and Stories

Alejandra Frausto Aceves*, Northwestern University, USA

Investigating Culturo-Techno-Contextual Approaches in Chemistry Education

Strand II: Cultural, Social, and Gender Issues

25-Mar-25, 12:45 PM-2:15 PM

Location: Azalea 1

Stand-Alone Paper

Breaking the Barriers to Meaningful Learning of STEM in Africa: A Systematic Review of Culturo-Techno-Contextual-Approach

Taibat Olateju, Obafemi Awolowo University, (OAU), Nigeria
Adekunle Oladejo, Africa Centre of Excellence for Innovative and Transformative STEM Education, Lagos State University (LASU-ACEITSE), Nigeria

Peter Okebukola, Africa Centre of Excellence for Innovative and Transformative STEM Education, Lagos State University (LASU-ACEITSE), Nigeria
Rasheed Sanni, Africa Centre of Excellence for Innovative and Transformative STEM Education, Lagos State University (LASU-ACEITSE), Nigeria

Juma Shabani, Burundi Doctoral School, University of Burundi, Burundi

Angela Irene, National Universities Commission (NUC), Nigeria

Stand-Alone Paper

Enhancing Students' Attitude towards Chemistry using Culturo- Techno-Contextual Approach

Joy Olayemi, Lagos State University, Nigeria

Michael Ahove, Lagos State University, Nigeria

Hakeem Akintoye, Lagos State University, Nigeria

Peter Okebukola*, Lagos State University, Nigeria

Rasheed Sanni, Lagos State University, Nigeria

Adekunle Oladejo, Lagos State University, Nigeria

Stand-Alone Paper

Exploring the Effectiveness of Culturo-Techno-Contextual Approach on Students' Achievement in Chemistry

Nwanneka Nwani, Lagos State University, Nigeria

Joy Olayemi, Lagos State University, Nigeria

Michael Ahove, Lagos State University, Nigeria

Hakeem Akintoye, Lagos State University, Nigeria

Peter Okebukola*, Lagos State University, Nigeria

Adekunle Oladejo, Lagos State University, Nigeria

AR and VR in STEM Education

Strand 12: Technology for Teaching, Learning, and Research
25-Mar-25, 12:45 PM-2:15 PM

Location: Baltimore 5

Stand-Alone Paper

Preliminary investigation of Taiwanese undergraduates' approaches to learning lunar phases by holographic projection

Yang-Hsin Fan, The University of Texas at Austin, USA

Tzung-Jin Lin*, National Taiwan Normal University, Taiwan

Stand-Alone Paper

Fostering conceptual understanding with real, virtual, combined real and virtual, or VR experiments

Salome Flegr*, TU Dresden, Germany

Jochen Kuhn, LMU Munich, Germany

Stand-Alone Paper

Teaching Elementary Science Content to Future Teachers Using VR and CS Tools

Richard Bex*, Illinois State University, USA

Kent Crippen, University of Florida, USA

Minji Yun, University of Florida, USA

Darby Drageset, University of Florida, USA

Joanne Barrett, University of Florida, USA

Maya Israel, University of Florida, USA

Stand-Alone Paper

Unveiling the Causes of Awe in VR Among College Students

Tyler Harper-Gampp*, North Carolina State University, USA

Cesar Delgado*, North Carolina State University, USA

Khalid Alharbi, North Carolina State University, USA

Matthew Peterson, North Carolina State University, USA

Karen Chen, North Carolina State University, USA

Equity and Identity in Science Learning

Strand 13: History, Philosophy, Sociology, and Nature of Science

25-Mar-25, 12:45 PM-2:15 PM

Location: Camellia 1

Stand-Alone Paper

'Who Do You Imagine as Scientists?': Intersecting NOS and Social Justice in Natural History Museums

Anna Pshenichny-Mamo*, Technion – Israel Institute of Technology, Israel

Wilton Lodge, University College London, United Kingdom

Dina Tsybulsky, Technion – Israel Institute of Technology, Israel

Stand-Alone Paper

Facing Time Alienation through the Learning of Science

Veronica Ilari, University of Bologna, Italy

Francesco De Zuani Cassina, University of Bologna, Italy

Olivia Levrini*, University of Bologna, Italy

Stand-Alone Paper

'I believe they consider me a scientist': Exploring connections between NOS understandings and science identities

Renee Schwartz*, Georgia State University, USA

Heidi Turcotte*, Georgia State University, USA

Julia Grimes*, Georgia State University, USA

Robert Bennett*, Georgia State University, USA

Aihan Maasen*, Georgia State University,
USA

Sureka Taylor*, Georgia State University,
USA

Stand-Alone Paper

Ensuring Equitable Opportunities to Improve How Blind Students Conceptualize the Nature of Science
Tina Stamper*, Indiana University, USA

Environmental Education

Strand 14: Environmental Education and Sustainability

25-Mar-25, 12:45 PM-2:15 PM

Location: Baltimore 3

Stand-Alone Paper

Environmental Health Education: A Way to Address Potential Health Risk from Pesticides in Kindergarten Students
Silvia Ramos De Robles*, University of Guadalajara, Mexico

Verónica Pérez Serrano Flores, Universidad Panamericana, Mexico

Irma García Villegas, University of Guadalajara, Mexico

Ana Alatorre Rodríguez, University of Guadalajara, Mexico

Claudia Huerta Rodea, Instituto Superior de Investigación y Docencia para el Magisterio, Mexico

Stand-Alone Paper

Enhancing learners' awareness about Indigenous Knowledge Systems benefits in environmental science classroom
Alvin Riffel, University of the Western Cape, South Africa

Frikkie George, Cape Peninsula University of Technology, South Africa

Keith Langenhoeven, University of the Western Cape, South Africa

Noluthando Hlazo, Cape Peninsula University of Technology, South Africa

Stand-Alone Paper

From Research to Classroom: Using Scholarly Expertise to Address the Phosphorus Challenge

Julianne Nieuwsma*, North Carolina State University, USA

M. Gail Jones*, North Carolina State University, USA

Madeline Stallard, North Carolina State University, USA

Stand-Alone Paper

Understanding interdisciplinary teaching and learning: Middle school case study of environmental sustainability education

Xavier Fazio*, Brock University, Canada

Limitations and constraints

Strand 14: Environmental Education and Sustainability

25-Mar-25, 12:45 PM-2:15 PM

Location: Baltimore 2

Stand-Alone Paper

Developing Middle School Students' Socioscientific Perspectives Through Digital Storytelling and Role-Playing Activities

RÜMEYSA KOÇ, MEB (MİLLİ EĞİTİM BAKANLIĞI), Turkey

BANU AVSAR ERUMIT, REcep Tayyip ERDOGAN UNIVERSITY, Turkey

Stand-Alone Paper

Rural Families Learning Geosciences Concepts in an Outdoor Children's Garden

Heather Zimmerman*, Penn State University, USA

Susan Land, Penn State University, USA

Bryan Brightbill, Penn State University, USA

Stand-Alone Paper

Constraints when Engaging with Locally Held, Landscape-Based Climate Knowledge in Map-based, Adult Peer-to-Peer Community Learning

Heather Killen*, University at Buffalo, USA

Stand-Alone Paper

A taxonomy of encounters and experiences to assist educators who leverage wildlife to engage learners

Bryan Nichols*, Florida Atlantic University, USA

Towards a More Robust and Justice-Oriented Genetics Education

Strand 1: Science Learning: Development of student understanding

25-Mar-25, 2:30 PM-4:00 PM

Location: Annapolis 2

Symposium

Towards a More Robust and Justice-Oriented Genetics Education

Ravit Duncan*, Rutgers University, USA

Deb Kelemen, Boston University, USA

Léa Tân Combette, Boston University, USA

Kostas Kampourakis, University of Geneva, Switzerland

Dalia Hassan, Rutgers University, USA

Michal Haskel-Ittah, Weizmann Institute of Science, Israel

Niklas Gericke, Karlstad University, Sweden

Malka van Dijk, Weizmann Institute of Science, Israel

Anat Yarden, Weizmann Institute of Science, Israel

Gregory Radick, University of Leeds, United Kingdom

Rishi Krishnamoorthy, University of Toronto, Canada

Dalia Hassan, Rutgers University, USA

Na'ama Av-Shalom, Rutgers University, USA

Phyllis Illari, University College London, United Kingdom

Federica Russo, Utrecht University,

Giora Alexandron, Weizmann Institute of Science, Israel

Asaf Salman, Weizmann Institute of Science,

Moriah Ariely, Weizmann Institute of Science,

Partners in Project and Place-Based

K-12 STEM Learning: A Model for

Ambitious Teaching and Learning

Strand 2: Science Learning: Contexts, Characteristics and Interactions

25-Mar-25, 2:30 PM-4:00 PM

Location: Annapolis 1

Related Paper Set

The Teaching School: Examining STEM Teacher Learning in Embedded, Extended, and Place-Based Teacher Education

Rachael Gordon, University of Michigan, USA

Elizabeth Moje, University of Michigan, USA

Bridget Maher*, University of Michigan,
USA
Alistair Bomphray, University of Michigan,
USA
Michaela O'Neill, University of Michigan,
USA

Related Paper Set

Tracing elementary student learning and literacies in residents' classrooms in science PPBL

Bridget Maher*, University of Michigan,
USA

Related Paper Set

Tracing high school students' engineering learning and literacies in residents' classrooms over time

Emily Rainey*, University of Pittsburgh,
USA

Bridget Maher*, University of Michigan,
USA

Elizabeth Moje, University of Michigan,
USA

Related Paper Set

Centering Students and Community: Designing and Engaging in Human-Centered Engineering and Design

Sneha Rathi*, Detroit Public Schools Community District, USA

Hunter Janness*, Detroit Public Schools Community District, USA

Rachael Gordon, University of Michigan, USA

Elizabeth Moje, University of Michigan, USA

Transforming STEM Learning Through Socioscientific Engagement Strand 5: College Science Teaching and Learning (Grades 13-20)
25-Mar-25, 2:30 PM-4:00 PM
Location: Magnolia 3

Stand-Alone Paper

Collaborative Causal-Loop Modeling as a Support Socioscientific Decision-Making

Eric Kirk*, University of North Carolina at Chapel Hill, USA

Heewoo Lee, University of North Carolina at Chapel Hill, USA

Troy Sadler, University of North Carolina at Chapel Hill, USA

Stand-Alone Paper

Using A Socio-scientific Issues Framework for Implementing Citizen Science Projects in an Undergraduate Biology Class.

Muhammad Ijaz*, University of Massachusetts-Dartmouth, USA

Hamza Malik, Lloyd Center for the Environment, USA

Stephen Witzig, University of Massachusetts-Dartmouth, USA

Stand-Alone Paper

Professional development for faculty to engage students as scientists using a socioscientific issues-based approach

Stephen Witzig*, University of Massachusetts - Dartmouth, USA

Muhammad Ijaz, University of Massachusetts - Dartmouth, USA

S.M. Mushfiqur Rahman Ashique, University of Massachusetts - Dartmouth, USA

Hamza Malik, The Lloyd Center for the Environment, USA

Rachel Stronach, University of Massachusetts - Dartmouth, USA
Kathryn Kavanagh, University of Massachusetts - Dartmouth, USA
Robert Gegear, University of Massachusetts - Dartmouth, USA

Stand-Alone Paper

Towards a Transformational STEM Consciousness: A Mixed Methods Study on a Liberatory STEM Outcome
Juan Garibay, University of Virginia, USA
Lindsay Wheeler, University of Virginia, USA

Exploring Science Learning Through

Outdoor and Real-World Experiences

Strand 6: Science Learning in Informal Contexts

25-Mar-25, 2:30 PM-4:00 PM

Location: Magnolia 2

Stand-Alone Paper

Nature-Based Learning as a Context for Science Inquiry: Benefits and Challenges from Students Perspective
Yetunde Mabadeje*, University of Iowa, USA
Kay Ramey, University of Iowa, USA
Mandy Dunphy, Baylor University, USA

Stand-Alone Paper

Encountering Freedom: A Comparative Case Study of a Formal Classroom and Nature-based Informal Learning Environment
Mandy Dunphy*, Baylor University, USA
Kay Ramey, University of Iowa, USA
Brian Hand, University of Iowa, USA
Ted Neal, University of Iowa, USA

Stand-Alone Paper

Students as Researchers Scientists: Connecting Real-world Experiences Scientific Concepts through a Coastal Ecology Summer Program

S.M. Mushfiqer Rahman Ashique*, University of Massachusetts Dartmouth, USA

Hamza Malik*, Lloyd Center for the Environment, USA

Rachel Stronach, Lloyd Center for the Environment, USA

Stephen Witzig, University of Massachusetts Dartmouth, USA

Stand-Alone Paper

Gardening During a Global Pandemic: Time for Nesting, Neighbors, Nature and Knowledge

Elysa Corin*, Institute for Learning Innovation, USA

Eric Jones, UT Health Houston, USA

Research, Methods and Assessment

in Preservice Teacher Education

Strand 7: Pre-service Science Teacher Education

25-Mar-25, 2:30 PM-4:00 PM

Location: Baltimore 1

Stand-Alone Paper

Humanized Science, Humanized Teaching: Examining How a Research Experience Supported one Pre-Service Teacher's Practice

Matthew Adams*, Michigan State University, USA

Lulu Bogun, Michigan State University, USA

David Stroupe, University of Utah, USA

Stand-Alone Paper

Fostering Productive scientific Discourse Through Talk Moves: Focus on undergraduate courses for pre-service science teachers

Hadeel Edrees Dabbah*, Ben-Gurion

University of the Negev, Israel

Orit Ben-Zvi Assaraf, Ben-Gurion

University of the Negev, Israel

Stand-Alone Paper

Assessment of pPCK Competency Profiles Using a Language Model and Machine Learning

Jannis Zeller*, Paderborn University, Germany

Josef Riese, Paderborn University, Germany

Stand-Alone Paper

A cluster analysis of pre-service physics teachers' attitudes towards digital media

David Weiler*, Eberhard Karls Universität Tübingen, Germany

Jan-Philipp Burde, Eberhard Karls Universität Tübingen, Germany

Rike Große-Heilmann, Universität Paderborn, Germany

Andreas Lachner, Eberhard Karls Universität Tübingen, Germany

Josef Riese, Universität Paderborn, Germany

Thomas Schubatzky, Universität Innsbruck, Austria

Empowering Teachers:

Computational Thinking and

Quantum Education

Strand 8: In-service Science Teacher Education

25-Mar-25, 2:30 PM-4:00 PM

Location: Annapolis 3

Stand-Alone Paper

Empowering Teacher-Driven Computational Thinking Integration through Collaborative Partnerships

Andrew Elby*, University of Maryland, USA

Amy Green*, University of Maryland, USA

Jennifer Radoff, University of Maryland, USA

Khusbu Dalal, University of Maryland, USA

Stand-Alone Paper

Exploring Factors Influencing Elementary Teachers Future Implementation of Computer Science Curricula Integrated with Math/Science

Dilara Kara-Zorluoglu*, University of Nevada Las Vegas, USA

Hasan Deniz, University of Nevada Las Vegas, USA

Ezgi Yesilyurt, Weber State University, USA

Erdogan Kaya, George Mason University, USA

Refika Turgut, University of South Carolina-Upstate, USA

Elif Adibelli-Sahin, Development Workshop, Turkey

Stand-Alone Paper

Qualitative Analysis of Precollege Teachers' Attitudes Towards Teaching Quantum Information Science and Technology

Michele Darienzo, Stony Brook University, USA

Angela Kelly*, Stony Brook University, USA

Tzu-Chieh Wei, Stony Brook University,
USA

Dominik Schneble, Stony Brook
University, USA

Stand-Alone Paper

*Teacher Knowledge of Quantum
Information Science and Technology
and Pedagogical Self-Efficacy*

Andrea Zinn, Stony Brook University, USA

Angela Kelly, Stony Brook University, USA

Tzu-Chieh Wei, Stony Brook University,
USA

Dominik Schneble, Stony Brook
University, USA

Michele Darienzo, Stony Brook University,
USA

Exploring the Systemic Nature of Curriculum Development and Implementation in Elementary Science

Strand 10: Curriculum and Assessment

25-Mar-25, 2:30 PM-4:00 PM

Location: Magnolia 1

Related Paper Set

*Iterative Design of Wondering
Elementary's Assessment System:
Promises and Challenges*

Amelia Gotwals*, Michigan State
University, USA

Christie Morrison Thomas, Michigan State
University, USA

Amanda Dahl, Michigan State University,
USA

Related Paper Set

*Design Considerations in Integrating
Mathematics for Scientific
Sensemaking in Elementary Science*

Cathery Yeh*, The University of Texas at
Austin, USA

Amy Johnson, The University of Texas at
Austin, USA

Lauren Rigby, The University of Texas at
Austin, USA

Related Paper Set

*Designing Curriculum-Based
Professional Learning for Elementary
Science Teachers: Addressing
Instructional Shifts and Supporting
Sensemaking*

Susan Gomez Zwieg*, BSCS Science
Learning, USA

Janna Mahfoud, BSCS Science Learning,
USA

Amy Belcastro, BSCS Science Learning,
USA

Related Paper Set

*Teachers' sensemaking of educative
features in OpenSciEd Elementary
Curriculum*

Kennedy Hay*, Oakland University, USA

María González-Howard*, University of
Texas - Austin, USA

Amber Bismack*, Oakland University, USA

Leticia Garza, University of Texas - Austin,
USA

Carla Robinson, University of Texas -
Austin, USA

Related Paper Set

*Organizational Contexts of the
Implementation of New OpenSciEd
Elementary Science Instructional
Materials*

Christa Haverly*, Northwestern University,
USA

Jason Buell*, Northwestern University,
USA

Yang Zhang, Northwestern University,
USA

Yaying Wu, Northwestern University, USA
Brian Reiser, Northwestern University, USA

Fostering Inclusive Praxis Within and Beyond the Science Classroom

Strand 11: Cultural, Social, and Gender Issues

25-Mar-25, 2:30 PM-4:00 PM

Location: Azalea 2

Stand-Alone Paper

Challenges in the study of inclusive science education – Results of a Delphi Study

Lisa Stinken-Rösner*, Bielefeld University, Germany

Jürgen Menthe, University of Hildesheim, Germany

Elizabeth Watts, Bauhaus-Universität Weimar, Germany

Felix Pawlak, Eberhard Karls University of Tübingen, Germany

Stand-Alone Paper

'Our ideas were reflected in the stage':

Investigating Fictive Kinships in a Community-Based STEM Program

Ti'Era Worsley*, Northern Virginia Community College, USA

Rasheda Likely, Kennesaw State University, USA

Stand-Alone Paper

Seeking Gender Equity in an Out-of-School Computer Science Program

Lydia Burke*, University of Toronto, Canada

Stand-Alone Paper

Generating Third Spaces of Science Learning for Urban Middle School Children in India's Public Schools

Nivedha Sundar*, Indiana University, USA
Gayle Buck, Indiana University, USA

Stand-Alone Paper

Empowering Science Praxis: Lessons from Socially Just Science Teacher of Color

KELLYANN RAMDATH*, University at Buffalo, USA

Venturing Beyond Boundaries to Explore Inclusive Practices in Science Education Across Contexts

Strand 11: Cultural, Social, and Gender Issues

25-Mar-25, 2:30 PM-4:00 PM

Location: Azalea 1

Related Paper Set

Connecting With Values in STEM Education: Integrating Indigenous and Western Learning in K-12 Classroom

Jennifer Jenkins*, Edith Bowen Laboratory School, USA

Breanne Litts*, Utah State University, USA

Melissa Tehee, Utah State University, USA

Darren Parry, University of Utah, USA

Stuart Baggaley, Edith Bowen Laboratory School, USA

Kenden Quayle, Utah State University, USA

James Cawley, Centerstar, USA

Related Paper Set

Community-led curriculum design: Community teacher perspectives on place-based education

Dayna DeFeo, University of Alaska Anchorage, USA

Trang Tran*, University of Alaska Anchorage, USA

Abby Rhinehart, University of Alaska Anchorage, USA

Related Paper Set

Fostering Familial Presence through an Identities-in-Practice Perspective

Wisam Sedawi*, University of Michigan, USA

Angela Calabrese Barton, University of Michigan, USA

Related Paper Set

Graduate Student Mentors' Navigation of Uncertainty in a Field Science Camp

Priyanka Parekh*, Northern Arizona University, USA

Ron Gray*, Northern Arizona University, USA

Future STEM Teachers Preparation in the AI Era

Strand 12: Technology for Teaching, Learning, and Research

25-Mar-25, 2:30 PM-4:00 PM

Location: Baltimore 4

Stand-Alone Paper

Preparing in-service science teachers for the AI era: insights from an "AI literacy" academic course

Ron Blonder*, Weizmann Institute of Science, Israel

Mutlu Cukurova, University College London, United Kingdom

Giora Alexandron, Weizmann Institute of Science, Israel

Stand-Alone Paper

Exploring Preservice Biology Teachers' Technology-Related Beliefs: A Network Analysis

Sarah Wilken*, University of Münster, Germany

Benedikt Heuckmann, University of Münster, Germany

Stand-Alone Paper

Exploring Challenges and Solutions in Implementing Computational Thinking in Elementary Science Education for Future Teachers

Yuanhua Wang*, West Virginia University, USA

Ugur Kale, Indiana University, USA

Stand-Alone Paper

A Longitudinal Investigation of Prompting Strategies among Pre-Service-Chemistry-Teachers in a Course on Generative Artificial Intelligence

Martin Sigot, University of Graz, Austria

Sebastian Tassotti*, University of Graz, Austria

Using Digital Tools in STEM Learning

Strand 12: Technology for Teaching, Learning, and Research

25-Mar-25, 2:30 PM-4:00 PM

Location: Baltimore 5

Stand-Alone Paper

Leftovers From COVID-19: Pre-Service Teachers Leveraging Digital Tools to Enhance Science Discourse

Bryan Brown*, Stanford University, USA

Lisa Archuleta*, Stanford University, USA

Polly Diffenbaugh, Stanford University, USA

Brandi Cannon-Force, Stanford University, USA

Stand-Alone Paper

Design Considerations of an AI-Powered Teacher Dashboard for Science Practical Work

Edwin Chng*, National Institute of Education, Singapore
Bertrand Schneider, Harvard Graduate School of Education, USA

Stand-Alone Paper

Enhancing Mathematical Modeling in Science Education through Simulation-Based Learning Environments.

Benjamin Stöger*, Technical University of Munich, Germany
Claudia Nerdel, Technical University of Munich, Germany

Stand-Alone Paper

Students' learning in a MOOC guided by in-field and out-of-field teachers

Guy Raviv*, Technion - Israel Institute of Technology, Israel
Asnat Zohar, Technion - Israel Institute of Technology, Israel
Shulamit Kapon*, Technion - Israel Institute of Technology, Israel

Disciplinary Expertise and Perspectives

Strand 13: History, Philosophy, Sociology, and Nature of Science

25-Mar-25, 2:30 PM-4:00 PM

Location: Camellia 1

Stand-Alone Paper

Cascading Mentorship and Nature of Scientist for a High School STEMM Internship

Bridget Mulvey*, Kent State University, USA

Stand-Alone Paper

Nature of Science from the Perspectives of Science Practitioners across Different Disciplines

Ceren Soysal*, Middle East Technical University, Turkey

Ceyhan Cigdemoglu, Atilim University, Turkey

Ömer Geban, Middle East Technical University, Turkey

Stand-Alone Paper

The Nature of Engineering: Bridging Gaps in Understanding Between Engineering Experts and Pre-service Science Teachers

Tamar Ginzburg, Technion - Israel Institute of Technology, Israel

Miri Barak, Technion - Israel Institute of Technology, Israel

Sibel Erduran, University of Oxford, United Kingdom

Stand-Alone Paper

Epistemological Beliefs about the Nature of Science of University Professors in Physics Teacher Education

Gabriela Ferreira*, University of Santa Catarina, Brazil

Dana Zeidler, University of South Florida, USA

Exploring How Embedding Indigenous Knowledge and Practices into STEM Education Promotes Health and Well-Being
Strand 14: Environmental Education and Sustainability
25-Mar-25, 2:30 PM-4:00 PM
Location: Woodrow Wilson Ballroom

Symposium

Exploring How Embedding Indigenous Knowledge and Practices into STEM Education Promotes Health and Well-Being

Julie Robinson*, University of North Dakota, USA
David Owens*, Georgia Southern University, USA
Lama Jaber*, Florida State University, USA
Sarah Voss*, Western Washington University, USA
Pauline Chinn*, University of Hawaii at Manoa, USA
Nichole Chlebek*, Florida International University, USA
Jadda Miller, UC Davis, USA
Franklin Aucapina*, New York Hall of Science, USA
Rebekah Hammack, Purdue University, USA
Bhaskar Upadhyay, University of Minnesota, USA

Integrating Strategies
Strand 14: Environmental Education and Sustainability
25-Mar-25, 2:30 PM-4:00 PM
Location: Baltimore 2

Stand-Alone Paper

Integrating Ethics and Values into Middle School Science: Adaptation and Implementation in a Rural School

Zhen Xu, University of North Carolina at Chapel Hill, USA
Rebecca Lesnefsky*, University of North Carolina at Chapel Hill, USA
Troy Sadler, University of North Carolina at Chapel Hill, USA
David Fortus, The Weizmann Institute of Science, Israel
Heewoo Lee, University of North Carolina at Chapel Hill, USA
Nannan Fan, University of North Carolina at Chapel Hill, USA
Keren Dalyot, The Weizmann Institute of Science, Israel
Shira Passentin, The Weizmann Institute of Science, Israel
Natasha Segal, The Weizmann Institute of Science, Israel

Stand-Alone Paper

Garden-based STEAM Learning and Childrens Self-efficacy for Environmental Action and Attitudes and Knowledge About Pollinators

Kathy Trundle*, Utah State University, USA
Rita Hagevik, University of North Carolina Pembroke, USA
Katherine Vela, Utah State University, USA
Lawrence Krissek, The Ohio State University, USA
Kaitlin Campbell, University of North Carolina Pembroke, USA
William Boone, Miami University, USA
Aurora Villa, Utah State University, USA

Stand-Alone Paper

Usable STEM: Student Outcomes Associated with The Iterative Science and Engineering Instructional Model
Nancy Songer*, University of Utah, USA
Julia Calabrese, University of Utah, USA
Holly Cordner, University of Utah, USA

Stand-Alone Paper

Nature's Mirror: Exploring Youths' Sense of Belonging in Social-Ecological Systems
Elizabeth Diaz-Clark, Colorado State University, USA
Anna Lavoie, Colorado State University, USA
Sara Bombaci, Colorado State University, USA
Meena Balgopal*, Colorado State University, USA

A showcase of research In Praise of Science Teachers funded by the US National Science Foundation:

Roundtable discussions

25-Mar-25, 4:15 PM-5:45 PM
Location: Woodrow Wilson Ballroom

Administrative Session

Organizers
Melissa Luna, National Science Foundation, USA
Ravit Duncan, The Rutgers University, USA

Education for Sustainable

Development in the context of Indigenous Knowledge Systems and contextual environments: Cases across Southern Africa and the United States of America
25-Mar-25, 4:15 PM-5:45 PM
Location: Azalea 3

Administrative Session

Organizers
Million Chauraya, Midland State University, Zimbabwe
Angela James, University of KwaZulu-Natal, South Africa
Presenters
Frackson Mumba, University of Virginia, Charlottesville, USA
Leonard Molefe, University of KwaZulu-Natal, South Africa
Nobuhle Mbanjwa, University of KwaZulu-Natal, South Africa
Martha Bishai, Umkhumbane Schools Project, Durban, South Africa
Julie Luft, University of Georgia, Athens, USA

National Academies of Sciences, Engineering, and Medicine Report on K-12 STEM Education and Workforce Development in Rural Areas

25-Mar-25, 4:15 PM-5:45 PM
Location: Baltimore 4

Administrative Session

Organizers
Rebekah Hammack, Purdue University, USA
Beth Cady, National Academies of Science Engineering and Medicine, USA
Presenters

Rebekah Hammack, Purdue University,
USA

Guan Saw,
Claremont Graduate University, USA

John McNamara, Washington State
University, USA

***Uncertainty in Science Education:
Shaping a Research Agenda for an
Emerging Field***

**Strand 2: Science Learning: Contexts,
Characteristics and Interactions**

25-Mar-25, 4:15 PM-5:45 PM

Location: Annapolis 2

Symposium

***Uncertainty in Science Education:
Shaping a Research Agenda for an
Emerging Field***

Marcus Kubsch*, Freie Universität Berlin,
Germany

Hannah Kolbe, Freie Universität Berlin,
Germany

Simon Tautz, IPN, Germany

Eugene Cox, University of Illinois Urbana-
Champaign, USA

Engin Kardas, Karlsruhe University of
Education, Germany

Ying-Chih Chen, Arizona State University,
USA

Eve Manz, Boston University, USA

Isa Korfmacher, University of Münster,
Germany

Simon Blauza, University of Münster,
Germany

Amanda Garner, University of Tennessee,
USA

***Collaborative and Interdisciplinary
Approaches to Facilitating
Elementary Science Teacher
Professional Development***

**Strand 3: Science Teaching — Primary
School (Grades preK-6): Characteristics
and Strategies**

25-Mar-25, 4:15 PM-5:45 PM

Location: Camellia 2

Stand-Alone Paper

***Citizen Science supports for
elementary school teachers:
Connecting science across disciplines***

Sarah Carrier*, North Carolina State
University, USA

Danielle Scharen*, Horizon Research, Inc.,
USA

Patrick Smith*, Horizon Research, Inc.,
USA

Christine Goforth, North Carolina Museum
of Natural Sciences, USA

Meredith Hayes, Horizon Research, Inc.,
USA

Stand-Alone Paper

***The Influence of Place-Based
Education on Elementary Teachers'
Sense of Agency for Science
Instruction***

Alison Mercier, University of Wyoming,
USA

Anica Miller-Rushing*, Associated
Universities Inc., USA

Stand-Alone Paper

***An Environmental Center and
Elementary School Partnership: A
Cross-Case Analysis of Two Fifth Grade
Teachers***

Rachel Stronach*, University of
Massachusetts Dartmouth, USA

Hamza Malik, Lloyd Center for the
Environment, USA

Stephen Witzig, University of Massachusetts Dartmouth, USA

Stand-Alone Paper

Making Space in Elementary Science Instruction: Fostering Math and Science Achievement Through Curriculum Professional Learning

Kristin Gagnier, AnLar, USA

Kelly Fisher, AnLar, USA

Steven Holochwost, CUNY, USA

Manda Harvey, Prince George's County Public Schools, USA

Hosun Kang, University of California Irvine, USA

Daniel Morales Doyle, University of Illinois Chicago, USA

Monet Harbison, Drexel University, USA

Articulating Different Conceptualizations and Methodological Approaches for Studying Justice-centered Science Teaching in Various Contexts
Strand 4: Science Teaching — Middle and High School (Grades 5-12): Characteristics and Strategies
25-Mar-25, 4:15 PM-5:45 PM
Location: Magnolia 1

Symposium

Articulating Different Conceptualizations and Methodological Approaches for Studying Justice-centered Science Teaching in Various Contexts

Natalie Davis, University of Michigan, USA
Maria Varelas, University of Illinois Chicago, USA
Angela Calabrese Barton, University of Michigan, USA
Wisam Sedawi, University of Michigan, USA
Edna Tan*, University of North Carolina at Greensboro, USA
Christopher Wright, Drexel University, USA

Fostering Equity and Engagement in Undergraduate STEM Education
Strand 5: College Science Teaching and Learning (Grades 13-20)
25-Mar-25, 4:15 PM-5:45 PM
Location: Magnolia 3

Stand-Alone Paper

STEM Engagement Program as Resource for First-Generation College Students Authoring Pathways and Practices in Science

Stacy Olitsky*, Saint Joseph's University, USA

Stand-Alone Paper

Examining undergraduate experiences with "servingness" in service-learning outreach to pre-college computer science and engineering classrooms

Azizi Penn, Purdue, USA

Tamara Moore*, Purdue, USA

Kerrie Douglas, Purdue, USA

Stand-Alone Paper

Finding Evolution in Our Everyday Lives: Impact of an Expectancy Value Theory Intervention

Lisa Borgerding*, Kent State University, USA

Hannah Petrosky, Kent State University, USA

Mark Kershner, Kent State University, USA

Stand-Alone Paper

Questing for Relevance: Exploring Student Outcomes from Creative Assessment "Quests" in General Education Biology
Emily Walter*, California State University, Fresno, USA
Neha Mann*, California State University, Fresno, USA
Berenice Mendoza-Alcaraz*, California State University, Fresno, USA

Supporting Informal Science

Educators and Learners

Strand 6: Science Learning in Informal Contexts

25-Mar-25, 4:15 PM-5:45 PM

Location: Magnolia 2

Stand-Alone Paper

How Educators Foster Learners' Interests, Self-Efficacy, and Outcome Expectations in an AI and Paleontology Camp
Christine Wusylko*, University of Florida, USA
Tonika Jones, University of Florida, USA
Ray Opoku, University of Florida, USA
Gabriella Haire, University of Florida, USA
Chih Hsuan Lin, University of Florida, USA
Nazanin Adhami, University of Florida, USA
Bruce McFadden, University of Florida, USA
Victor Perez, St. Mary's College of Maryland, USA
Brian Abramowitz, University of Florida, USA
Pavlo Antonenko, University of Florida, USA

Stand-Alone Paper

Supporting STEM identity development in Hispanic community college students via an informal science education internship
James Kisiel*, California State University Long Beach, USA

Stand-Alone Paper

Motivation And Barriers of Pre-Service Science Teachers About Outdoor Education
Soykan Sandıkçıoğlu*, Middle East Technical University, Turkey
Özgül Yılmaz Tüzün, Middle East Technical University, Turkey

Stand-Alone Paper

Unseen/Unsupported: Investigating Work Experiences of Informal Science Educators in Part-Time, Seasonal, and Temporary Roles
K. "Ren" Mendoza*, University of Nebraska at Omaha, USA
Emma Revem, Durham Public Schools, United Kingdom
Mahima Saxena, University of Nebraska at Omaha, USA
Thomas Beatman, Omaha's Henry Doorly Zoo and Aquarium, USA
Maddie Lichti, University of Nebraska at Omaha, USA

Advancing Competencies and Reasoning in Preservice Science Teachers

Strand 7: Pre-service Science Teacher Education

25-Mar-25, 4:15 PM-5:45 PM

Location: Baltimore 1

Stand-Alone Paper

Decision-making competence of pre-service teachers regarding health-related dilemmas: an interview study on a competence model

Helena Aptyka*, University of Cologne, Cologne, Germany, Germany

Marleen Proksch, University of Cologne, Cologne, Germany, Germany

Jörg Großschedl, University of Cologne, Cologne, Germany, Germany

Kirsten Schlüter, University of Cologne, Cologne, Germany, Germany

Stand-Alone Paper

How can students distribute epistemic agency? Looking at regulative agency to better understand students' positions.

Carolina Barros*, Interunit Graduate Program in Sciences Teaching – University of São Paulo, Brazil

Maíra Batistoni e Silva, Physiology Department, Bioscience Institute of University of São Paulo, Brazil

Stand-Alone Paper

Uncovering Aspects Helping Pre-service Science Teachers to Use Modeling Practices

Paul Engelschalt*, Humboldt-Universität zu Berlin, Germany

Erik Maslyak, Humboldt-Universität zu Berlin, Germany

David Fortus, Weizmann Institute of Science, Israel

Dirk Krüger, Freie Universität Berlin, Germany

Annette Upmeier zu Belzen, Humboldt-Universität zu Berlin, Germany

Exploring STEM in Teacher Preparation programs

Strand 7: Pre-service Science Teacher Education

25-Mar-25, 4:15 PM-5:45 PM

Location: Baltimore 2

Stand-Alone Paper

Position: Revising STEM Teacher Preparation Courses to Ground in Pedagogies of Care and Reflection

Christina Baze*, Northern Arizona University, USA

Stand-Alone Paper

Exploring the Relationship Between Science Content Knowledge and Engineering Practices in Preservice Teacher Education

Stacey Sneed*, Texas Tech University, USA

Jianlan Wang, Texas Tech University, USA

Stand-Alone Paper

Science/mathematics teaching identity constructs as predictors of persistence in a teacher preparation program.

Ingelise Giles*, Florida International University, USA

Zahra Hazari*, Florida International University, USA

Stand-Alone Paper

Engineering Design and the Development of Teacher Efficacy

Laura Wheeler*, Brigham Young University, USA

Ryan Nixon, Brigham Young University,
USA

Adapting to Empower: Examining Teachers' Practical Ideologies for Promoting Epistemic Agency and Critical Science Agency

Strand 8: In-service Science Teacher Education

25-Mar-25, 4:15 PM-5:45 PM

Location: Annapolis 3

Related Paper Set

Beyond the Right Answer: Teachers' Ideological Stances and Pedagogical Decision-Making in Supporting Students' Epistemic Agency

Kevin Hall*, University of Illinois at Urbana-Champaign, USA

Nicholas Leonardi*, University of Illinois at Urbana-Champaign, USA

Logan Lauren, University of Illinois at Urbana-Champaign, USA

Christina Krist, Stanford University, USA

Barbara Hug, University of Illinois at Urbana-Champaign, USA

Related Paper Set

Finding the 'Sweet Spot' for Adaptations Leading to Pedagogically Generative Learning

Barbara Hug*, University of Illinois Urbana-Champaign, USA

Christina Krist*, Stanford University, USA

Nicholas Leonardi, University of Illinois Urbana-Champaign, USA

Kevin Hall, University of Illinois Urbana-Champaign, USA

Logan Lauren, University of Illinois Urbana-Champaign, USA

Related Paper Set

Community Asset Mapping as an Inroad to Critically Conscious Adaptation

Nga Hoang*, University of Colorado Boulder, USA

Melissa Campanella*, University of Colorado Boulder, USA

Kerri Wingert, Good Questions Research, USA

Mon-Lin Monica Ko, University of Colorado Boulder, USA

Related Paper Set

Leveraging Composite Methodologies for Characterizing Science Teacher Educators' Critical Consciousness

Enrique Suárez*, University of Massachusetts Amherst, USA

Erica Light, University of Massachusetts Amherst, USA

Learning from Women and Girls of Color in STEM Education

Strand 11: Cultural, Social, and Gender Issues

25-Mar-25, 4:15 PM-5:45 PM

Location: Azalea 1

Stand-Alone Paper

"Goodbye to what has been..." A Re-evaluation of The Black Women Experience in STEM

Jasmyne Yeldell*, UNC Chapel Hill, USA

Simone Wilson*, UNC Chapel Hill, USA

Anina Mahmud, UNC Chapel Hill, USA

Dionne Cross Francis, UNC Chapel Hill, USA

Kerrie Wilkins-Yel, UMass Boston, USA

Stand-Alone Paper

'Through the fire...: Re-Examining mental health and persistence in STEM for Women of Color

Simone Wilson*, University of North Carolina at Chapel Hill, USA

Seonmi Jin, Indiana University, USA

Pavneet Kaur Bharaj, California State University, USA

Jasmyne Yeldell, University of North Carolina at Chapel Hill, USA

Anina Mahmud, University of North Carolina at Chapel Hill, USA

Kerrie Wilkins-Yel, University of Massachusetts, USA

Dionne Cross-Francis, University of North Carolina at Chapel Hill, USA

Stand-Alone Paper

What motivates career decisions of Women of Color in STEM? Exploration using Situated Expectancy-Value Theory

Anina Mahmud*, University of North Carolina at Chapel Hill, USA

Pavneet Bharaj, California State University, Long Beach, USA

Jasmyne Yeldell*, University of North Carolina at Chapel Hill, USA

Dionne Cross Francis, University of North Carolina at Chapel Hill, USA

Aishwarya Shridhar, University of Massachusetts Boston, USA

Kerrie Wilkins-Yel, University of Massachusetts Boston, USA

Stand-Alone Paper

Dear Science Teacher: A Message from Black and Latina Girls

Laura Peña-Telfer*, Georgia State University, USA

Natalie King, Georgia State University, USA

Reframing Science, Technology, and Society through Indigenous STEM Education

Strand 11: Cultural, Social, and Gender Issues

25-Mar-25, 4:15 PM-5:45 PM

Location: Annapolis 4

Symposium

Reframing Science, Technology, and Society through Indigenous STEM Education

Yu-Chieh Wu, University of Hawai'i at Mānoa, USA

Peresang Sukinarhimi, National Sun Yat-sen University, Taiwan

Paichi Pat Shein*, National Sun Yat-sen University, Taiwan

Keiphe Setlhatlhanyo, University of Botswana, Botswana

Richie Moalosi, University of Botswana, Botswana

Yaone Rapitsenyane, University of Botswana, Botswana

Ritesh Khunyakari, Tata Institute of Social Sciences, India

Sefiso Khumalo, Da Vinci Institute of Technology, South Africa

Indu Viswanathan, Hindu University of America, USA

Piata Allen, School of Māori and Indigenous Education, New Zealand

STEM Education in Social-Cultural Context

Strand 12: Technology for Teaching, Learning, and Research

25-Mar-25, 4:15 PM-5:45 PM

Location: Baltimore 5

Stand-Alone Paper

Where Culture, Technology, and Context Meet: Enhancing Artificial Intelligence Education through CTCA

Sia Koroma, Lagos State University, Nigeria

Esther Peter, Lagos State University, Nigeria

David Peter, Lagos State University, Nigeria

Peter Okebukola, Lagos State University, Nigeria

Juma Shabani, University of Burundi, Burundi

Deborah Agbanimu, National Open University, Nigeria

Franklin Onowugbeda, Lagos State University, Nigeria

Adekunle Oladejo, Lagos State University, Nigeria

Olasunkanmi Gbeleyi, Lagos State University, Nigeria

Stand-Alone Paper

Black Middle Schoolers' Artificial Intelligence Self-Efficacy and Outcome Expectations in a Summer STEM Camp

Ray Opoku*, University of Florida, USA

Tonika Jones, University of Florida, USA

Gabriella Haire, University of Florida, USA

Christine Wusylko, University of Florida, USA

Chih Hsuan Lin, University of Florida, USA

Nazanin Adhami, University of Florida, USA

Natalie King, Georgia State University, USA

Pavlo Antonenko, University of Florida, USA

Stand-Alone Paper

Supporting Blended Math-Science Sensemaking Among College Students from Backgrounds Historically Marginalized in STEM Using Simulations

Leonora Kaldaras*, TexasTech University, USA

Carl Wieman, Stanford University, USA

Stand-Alone Paper

Adoption of Virtual Laboratories by Science Teachers in the Global South: Insights from South Africa

BRIAN SHAMBARE*, University of the Free State, South Africa

Thuthukile Jita, University of the Free State, South Africa

Scientific Literacy, Inquiry, and Representation

Strand 13: History, Philosophy, Sociology, and Nature of Science

25-Mar-25, 4:15 PM-5:45 PM

Location: Camellia 1

Stand-Alone Paper

What is Scientific Literacy: a 24 year meta-analysis

Judith Lederman*, Illinois Institute of Technology, USA

Renee Schwartz*, Georgia State University, USA

Selina Bartles, Valparaiso University, USA

Valarie Akerson, Indiana University, USA

Stand-Alone Paper

Scientific Literacy for Elementary Students- Kindergarten a Baseline Study

Selina Bartels*, Valparaiso University, USA
Judith Lederman*, Illinois Institute of Technology, USA

School Education Role

Strand 14: Environmental Education and Sustainability

25-Mar-25, 4:15 PM-5:45 PM

Location: Baltimore 3

Stand-Alone Paper

How Do High School Students See Climate Change? Examining Climate Change Visualizations in Lesson Plans

Kathleen Bordewieck*, North Carolina State University, USA

M. Gail Jones, North Carolina State University, USA

Rebecca Ward, North Carolina State University, USA

Sarah Carrier, North Carolina State University, USA

Meghan Manfra, North Carolina State University, USA

Madeline Stallard, North Carolina State University, USA

Tanzimul Ferdous, North Carolina State University, USA

Amber Meeks, North Carolina State University, USA

Stephanie Fiocca, North Carolina State University, USA

Beth Shaver, North Carolina State University, USA

Stand-Alone Paper

Latinx Students as Agents of Change in Community Environmental Issues: Teachers' Perspectives

Clare Baek*, University of California, Irvine, USA

Victoria Nguyen, University of California, Irvine, USA

Symone Gyles, University of California, Irvine, USA

Mark Warschauer, University of California, Irvine, USA

Stand-Alone Paper

Preschoolers' Experiential Learning in Educational Farm—Cognitive and Emotional Effects

Ornit Spektor-Levy*, Bar Ilan University, Israel

Moshe Castoriano, Bar Ilan University, Israel

Stand-Alone Paper

Island STYLE: Impacting Students Through Place-based Environmental Education Programs

Carol Waters*, University of Houston-Clear Lake, USA

Michelle Peters, University of Houston-Clear Lake, USA

Advancing AI in Science Education (AASE): Responsible and Ethical Uses of AI in Science Education

25-Mar-25, 6:00 PM-7:30 PM

Location: Azalea 3

Social Event

Organizers

Xiaoming Zhai, University of Georgia, Athens, USA

2025 NARST Annual International Conference, Washington DC

Kent Crippen, University of Florida, USA

Panelists

Kevin Haudek, Michigan State University,
USA

Juan-Carlos Aguilar, Department of
Education, Georgia, USA

Lei Liu, ETS, USA

Xiufeng Liu, University of Macau, China

Kecia Ray, , USA

Marcia Linn, UC Berkeley, USA

Knut Nuemann, IPN, Germany

Ross Nehm, University of Stony Brook, USA

Okhee Lee, University of New York, USA

Natalie King, Georgia State University, USA

Yizhu Gao, University of Georgia, USA

Gyeong-Geon Lee, National Institute of
Education, Singapore

Jamie Mikeska, ETS,

Writing a Winning Grant Proposal:

Tips and Advice from API scholars

25-Mar-25, 6:00 PM-7:00 PM

Location: Azalea 1

Social Event

Organizers

Hosun Kang, University of California Irvine,
USA

Edna Tan, University of North Carolina
Greensboro, USA

Jennifer Tripp, University at Buffalo, USA

Peng He, Washington State University,
Pullman, USA

Xiufeng Liu, University of Macau, China

Panelists

Okhee Lee, University of New York, USA

Li Ke, University of Nevada Reno, USA

***Fireside Chat: Networking,
Socializing, and Connecting Among
the ISK-RIG Membership***

25-Mar-25, 6:00 PM-7:00 PM

Location: Annapolis 1

Social Event

Organizers

Julie Robinson, University of North Dakota,
Grand Forks, USA

Panelists

Bhaskar Upadhyay, University of
Minnesota, USA

Pauline Chinn, University of Hawaii at
Manoa, USA

Sharon Nelson-Barber, WestEd, USA

Equity and Ethics Dinner

25-Mar-25, 6:00 PM-9:00 PM

Location: Offsite

Social Event

Organizers

Iliana De La Cruz, Texas A&M University,
College Station, USA

Dominick Fantacone, SUNY Cortland,
USA

In-Person Conference 26 March 2025

NARST Fellows Breakfast
26-Mar-25, 7:00 AM-8:00 AM
Location: Magnolia 2

Social Event

Membership and Business Meeting
26-Mar-25, 8:00 AM-8:45 AM
Location: Cherry Blossom Ballroom

Expanding Horizons: Innovations in Science Outreach
26-Mar-25, 9:00 AM-10:30 AM
Location: Azalea 2

Administrative Session

Organizers

Cristina Guarrella, Australasian Science Education Research Association (ASERA), Australia

Linda Hobbs, Australasian Science Education Research Association (ASERA), Australia

Presenters

Cristina Guarrella, Australasian Science Education Research Association (ASERA), Australia

Linda Hobbs, Australasian Science Education Research Association (ASERA), Australia

Victoria Millar, The University of Melbourne, Australia

Kyla Adams, University of Western Australia, Perth, Australia

Learning to live with the world: The role of science education

26-Mar-25, 9:00 AM-10:30 AM
Location: Baltimore 3

Administrative Session

Organizers

Lucy Avraamidou, University of Groningen, Netherlands
Giulia Tasquier, University of Bologna, Italy

Panelists

Katarina Gunter, Umea University, Sweden
Wonyong Park, University of Southampton, UK
Duru Bayram, Eindhoven University of Technology, Netherlands
Nayif Awad, Sakhnin Academic College For Teacher Education, Israel
Sara Wilmes, University of Luxembourg, Luxembourg
Marta Romero Ariza, University of Jaén, Spain
Lama Jaber, Florida State University, USA
Felicia Moore Mensah, Teachers College, Columbia University, USA

From Data to Discourse: Enhancing Scientific Communication and Argumentation Skills

Strand 1: Science Learning: Development of student understanding

26-Mar-25, 9:00 AM-10:30 AM

Location: Azalea 3

Stand-Alone Paper

Does size matter? Dealing with diagrams presenting different data amounts when justifying scientific claims

Gregor Benz*, Technical University

Munich, Germany

Tobias Ludwig, Karlsruhe University of Education, Germany

Andreas Vorholzer, Technical University Munich, Germany

Stand-Alone Paper

What makes you argue? Prompting students' arguments during an ecology class

Rena Orofino*, University of São Paulo, Brazil

Jenifer Xavier, EE. Profa Dinorah Silva dos Santos, Brazil

Melina Leite, University of São Paulo, Brazil

Daniela Scarpa, University of São Paulo, Brazil

Stand-Alone Paper

Reconnecting students' views of NOS to argumentation from an epistemological perspective

Jing Lin*, Beijing Normal University, China

Hongyan Zhao, Beijing Normal University, China

Letong Zhang, Renmin University of China, China

Xiaowei Tang, University of Macau, China

Building Science Understanding and Memory through Cultural Context and Interactions

Strand 2: Science Learning: Contexts, Characteristics and Interactions

26-Mar-25, 9:00 AM-10:30 AM

Location: Camellia 1

Stand-Alone Paper

Contextualizing Teaching of Genetic: Leveraging Culture and Technology for Enhanced Learning Outcomes

Franklin Onowugbeda, Lagos State University, Nigeria

Peter Okebukola*, Lagos State University Nigeria

Juma Shabani, University of Burundi, Burundi

Umar Adam, Lagos State University, Nigeria

Stand-Alone Paper

Impact of Childhood Spatial and Nonspatial Activity on Learner's Verbal and Visuospatial Working Memory Capacity

Seth Davis, University of Florida, USA

Muhammad Rehman*, University of Florida, USA

Do Hyong Koh*, University of Florida, USA

Christine Wusylko, University of Florida, USA

Xiaoman Wang, University of Florida, USA

Priya Prasad, University of Florida, USA

Pavlo Antonenko, University of Florida, USA

Kara Dawson, University of Florida, USA

Jonathan Martin, University of Florida, USA

Ellen Martin, University of Florida, USA

Stand-Alone Paper

Peer Interaction and Conceptual Development: A Multimodal Interaction Analysis

John Galisky*, UC Santa Barbara, USA

Strengthening Collaboration in Science Education

Strand 2: Science Learning: Contexts, Characteristics and Interactions

26-Mar-25, 9:00 AM-10:30 AM

Location: Camellia 2

Stand-Alone Paper

Exploring the Role of Student Authority Relations in Science Group Collaboration

Yining Zhou, East China Normal University, China

Haoxuan Yang, East China Normal University, China

Sihan Xiao, East China Normal University, China

Stand-Alone Paper

Exploring Students' Collaborative Regulation of Learning and Chemical Thinking During a Dynamic-Authentic Learning Experience

Noah Amir*, Technion – Israel Institute of Technology, Israel

Shirly Avargil, Technion – Israel Institute of Technology, Israel

Stand-Alone Paper

A Case Study of Fostering Positive Interdependence in Secondary Science Classrooms through Multimodal Collaborative Learning

Jiaxin Chen*, The University of Hong Kong, China

Jiaojiao Hui*, The University of Hong Kong, China

Guojun Xu, Hangzhou Yinhua Experimental Middle School, China

CHEN CHEN, The University of Hong Kong, China

Roundtables 3

26-Mar-25, 9:00 AM-10:30 AM

Location: Cherry Blossom Ballroom

Strand 3: Science Teaching — Primary School (Grades preK-6): Characteristics and Strategies

Roundtable

Developing a Framework to Characterize Talk Moves to Encourage Cross-Team Argument Critique in Engineering Discussions

Pamela Lottero-Perdue*, Towson University, USA

Jamie Mikeska, ETS, USA

Strand 3: Science Teaching — Primary School (Grades preK-6): Characteristics and Strategies

Roundtable

How Primary STEM Teaching Learning Supports Student Readiness for Blended Learning: Six Teaching Profiles

Karlis Greitans*, University of Latvia, Latvia

Dace Namstone, University of Latvia, Latvia

Ildze Čakāne, University of Latvia, Latvia

Strand 3: Science Teaching — Primary School (Grades preK-6): Characteristics and Strategies

Roundtable

How Do French Kindergarten Teachers regulate the verbal

interactions during explicit Scientific Inquiry-Based Sequences?

Estelle Blanquet*, INSPE of Bordeaux,

France

Eric Picholle, INPHYNI, CNRS, France

Strand 3: Science Teaching — Primary School (Grades preK-6): Characteristics and Strategies

Roundtable

Linking Teacher Agency to Learning Orientation in Generative Environments: Insights from a Multiple Case Study

Jee Kyung Suh*, University of Alabama, USA

Jale Dursun, University of Alabama, USA

Brian Hand, University of Iowa, USA

Strand 3: Science Teaching — Primary School (Grades preK-6): Characteristics and Strategies

Roundtable

'They really matter!': Relationships' impact on elementary teachers' sense of agency for teaching science

Anica Miller-Rushing*, Associated

Universities Inc., USA

Alison Mercier, University of Wyoming, USA

Strand 3: Science Teaching — Primary School (Grades preK-6): Characteristics and Strategies

Roundtable

Investigation of Disadvantaged Students' STEM Identity Development During Extracurricular STEM Activities

Guler Akkor, Aydin Adnan Menderes University, Turkey

Arzu Tanis Ozcelik*, Aydin Adnan Menderes University, Turkey

Strand 5: College Science Teaching and Learning (Grades 13-20)

WIP Roundtable

Competitors or Community: Attending to Social Networks to Disrupt the Status Quo in STEM

Sombo Koo, UC Davis, USA

Téa Pusey*, UC Davis, USA

José Oyola Cortes, UC Davis, USA

Becca VanArnam, UC Davis, USA

Andrew Hood, UC Davis, USA

Sanjana Dhamankar, UC Davis, USA

Theron Sowers, UC Davis, USA

Rebecca Ambrose, UC Davis, USA

Strand 5: College Science Teaching and Learning (Grades 13-20)

WIP Roundtable

Assessing the Impact of a Culturally Inclusive Teaching Institute for STEM Community College Faculty

Bernadette Sibuma*, Massachusetts Bay Community College, USA

Jayne Ryczkowski, Massachusetts Bay Community College, USA

Meredith Watts, Massachusetts Bay Community College, USA

Strand 5: College Science Teaching and Learning (Grades 13-20)

WIP Roundtable

Exploring Collective Activity in Mentoring Underrepresented Students within Undergraduate Research Programs in STEM

Hyoung Joon Park*, Oregon State University, USA

Jana Bouwma-Gearhart, Oregon State University, USA

Barbara Ettenauer, Oregon State University, USA

Strand 13: History, Philosophy, Sociology, and Nature of Science Roundtable

Feminist Materialist Teaching Practices and the Conceptualization of Trust in Science Education
Anna Skorupa*, New York University, USA
Shaghig Chaparian*, New York University, USA
Leah Master*, New York University, USA
Catherine Milne*, New York University, USA

Strand 6: Science Learning in Informal Contexts Roundtable

Exploring Childrens Environmental Identity in Third Spaces
Srijana Katuwal*, Ohio University, USA
Rejoice Vorsah, Ohio University, USA
Sara Salloum, Ohio University, USA
Danielle Dani, Ohio University, USA

Strand 6: Science Learning in Informal Contexts Roundtable

Refiguring Identities: Cultivating Epistemic Agency in African American Students Through Engineering Practices in STEM

Lezly Taylor*, Virginia Tech, USA
George Glasson, Virginia Tech, USA
Brenda Brand, Virginia Tech, USA

Strand 6: Science Learning in Informal Contexts

WIP Roundtable

'Nature leads, and throws up questions for science to answer': Science and Natural Hair
Grace Tukurah*, Michigan State University, USA

Strand 7: Pre-service Science Teacher Education

WIP Roundtable

Improving Science Teaching: A Comparative Study of Online and Traditional Science Methods Course Modalities

Burak Sahin*, University of Nevada, Las Vegas, USA
Mazie Dyess, University of Nevada, Las Vegas, USA
Katherine Wade-Jaimes, University of Nevada, Las Vegas, USA

Strand 7: Pre-service Science Teacher Education

WIP Roundtable

Preservice teachers' understanding of NGSS-aligned science instruction measured by a modified SIPS survey
Youngjin Song*, California State University Long Beach, USA

Sara Dozier, California State University Long Beach, USA
Lisa Martin-Hansen*, California State University Long Beach, USA
Thao Tran, California State University East Bay, USA
Michele Korb, California State University East Bay, USA

Strand 7: Pre-service Science Teacher Education

WIP Roundtable

Encouraging Pre-Service Teachers to Embrace STEM Education through Multidisciplinary Collaborations

UrLeaka Newsome*, Tennessee State University, USA
Catherine Armwood-Gordon, Tennessee State University, USA
Reniece Mashburn, Tennessee State University, USA

Strand 5: College Science Teaching and Learning (Grades 13-20)

WIP Roundtable

Investigating undergraduate biology students understanding of plant physiology using concept inventory

Meena Kharatmal*, Homi Bhabha Centre for Science Education (Tata Institute of Fundamental Research), India

Mayur Gaikwad, Sophia College, India

Aashutosh Mule, Somaiya College, India

Strand 8: In-service Science Teacher Education

Roundtable

Influences and expressions of in-service elementary teacher agency for science: Deeply considering the SETSA framework

Anica Miller-Rushing*, Associated Universities Inc., USA

Alison Mercier, University of Wyoming, USA

Strand 8: In-service Science Teacher Education

Roundtable

A Systematic Review of Equity-Centered Mentoring for PreK-12 Science Educators

Raju Ahmed*, University of Houston, USA

Sissy Wong, University of Houston, USA

Strand 8: In-service Science Teacher Education

Roundtable

Strengthening Elementary STEM Teacher Identity through Quantum Content and Curriculum

Nancy Holincheck*, George Mason University, USA

Jennifer Simons*, George Mason University, USA

Stephanie Dodman, George Mason

University, USA

Xiaolu Zhang, George Mason University, USA

Jessica Rosenberg*, George Mason University, USA

Benjamin Dreyfus, George Mason University, USA

Julia Lipman, George Mason University, USA

Strand 8: In-service Science Teacher Education

WIP Roundtable

Using an intersectional approach to uncover inequities in access to research experience for teachers programs

Amanda Morrison*, Oregon State University, USA

Strand 8: In-service Science Teacher Education

WIP Roundtable

Examining Critical Reflexivity in STEM Career Change Teachers

Jennifer Simons*, George Mason University, USA

Strand 11: Cultural, Social, and Gender Issues

Engineering as Culturally Responsive Science Education Amidst CRT and DEI Prohibitions

Christopher Irwin*, Florida International University, USA

Berry Lamy, Florida International University, USA

Joshua Ellis, Louisiana State University, USA

Andrew Green, Engineering For Us All, USA

Nicholas Oehm, Florida International University, USA

Darryl Dickerson, Florida International University, USA

Strand 11: Cultural, Social, and Gender Issues

Roundtable

Towards a Science Education Chimera and Possibilities for Professional Learning

Linsey Brennan*, Michigan State University, USA

Terrance Burgess, Michigan State University, USA

Strand 11: Cultural, Social, and Gender Issues

WIP Roundtable

Implications for Black Individuals in STEM within the Mid-Atlantic Region: A Systematic Literature Review

Jess Edwards*, American University, USA

Martinique Sealy, American University, USA

Shari Watkins, American University, USA

Brian McGowan, American University, USA

Ihsan Hawkins, American University, USA

Zaki Hawkins, American University, USA

Strand 11: Cultural, Social, and Gender Issues

WIP Roundtable

Catalytic catharsis: breaking the self-perpetuating cycle of unchanging white anti-racism in science education

Michael Nocella*, University of Illinois Chicago, USA

Strand 11: Cultural, Social, and Gender Issues

WIP Roundtable

We Are Empowered! The Positionality of Black Women Science Teachers to Engage Black Girls

Teresa Massey*, Georgia State University, USA

Strand 11: Cultural, Social, and Gender Issues

WIP Roundtable

Translanguaging in Science

Classrooms: Student Perspectives on and Identity Outcomes of Using Multilingualism in Science

Alexis Rutt*, University of Mary Washington, USA

Erich Sneller, Harrisonburg City Public Schools, USA

Elizabeth Hunter, Harrisonburg City Public Schools, USA

Strand 11: Cultural, Social, and Gender Issues

Roundtable

Exploring how language is framed to describe impostor phenomenon in STEM fields

Devasmita Chakraverty*, Indian Institute of Management Ahmedabad, India

Strand 11: Cultural, Social, and Gender Issues

WIP Roundtable

Is it culturally responsive teaching if the teacher does not call it that?

Elaine Howes*, American Museum of Natural History, USA

Jamie Wallace*, American Museum of Natural History, USA

Strand 11: Cultural, Social, and Gender Issues

WIP Roundtable

Science and language: how can we support student integration?

Maiza de Albuquerque Trigo*, University of Luxembourg, Luxembourg

Pit Lepage, Ministry of Education, Luxembourg

Thierry Frentz, Ministry of Education,
Luxembourg

Strand 11: Cultural, Social, and Gender Issues

WIP Roundtable

Examining Culturally Relevant Dispositions in District Science Coordinators and Science Teachers
Meredith Schwendemann*, Clemson University, USA
Brooke Whitworth, Clemson University, USA
Julie Luft, University of Georgia, USA

Strand 15: Policy, Reform, and Program Evaluation

Roundtable

A Case for Elevating Community STEM Brilliance Beyond the Pipeline in Global Policy Discourses
Meredith Bittel*, University of Kansas, USA
Alexander Bittel*, University of Kansas, USA

Strand 15: Policy, Reform, and Program Evaluation

WIP Roundtable

Leader Identity Construction of Science Teachers who use Social Media to Advocate for Science Education
Rachel Benzoni*, University of Nebraska-Lincoln, USA

Reshaping traditional science teaching methods to deepen student understanding and engagement

Strand 4: Science Teaching — Middle and High School (Grades 5-12): Characteristics and Strategies

26-Mar-25, 9:00 AM-10:30 AM
Location: Baltimore 4

Stand-Alone Paper

The Potential of an "Epistemic Boost" to Support Student Belonging in Science

Corinne Singleton*, University of Colorado Boulder, USA

William Penuel, University of Colorado Boulder, USA

Anna-Ruth Allen, University of Colorado Boulder, USA

Clarissa Deverel-Rico, University of Colorado Boulder, USA

Andrew Krumm,² School of Information and Michigan Medicine, University of Michigan, USA

Carol Pazera,³ Charles A. Dana Center, University of Texas, Austin, USA

Stand-Alone Paper

System Thinking Approach in Fostering Students' Understanding of the Concept of Chemical Equilibrium

Guluzar EYMUR*, Giresun University, Turkey

Stand-Alone Paper

Recognized and Realigned: A Veteran Teacher's Moves to Realign Familiar Forms of Epistemic Agency

Christine Hirst Bernhardt*, University of Maryland, USA

Andrew Elby, University of Maryland, USA

Stand-Alone Paper

Variations in Epistemological Messaging in High School Biology
Cynthia Passmore*, University of California, Davis, USA
Hessam Ghanimi, University of California, Davis, Saint-Barthélemy
Cari Hermann-Abell, BSCS Science Learning, USA
Patricia Olson, BSCS Science Learning, USA
Jeffrey Snowden, BSCS Science Learning, USA
Molly Stuhlsatz, BSCS Science Learning, USA
Chris Wilson, BSCS Science Learning, USA

Stand-Alone Paper

Multiple Case Studies of Middle School Students' Epistemic Practices of Engineering During Integrated STEM Unit
Muhammad Purwanto*, University of Minnesota-Twin Cities, USA
Gillian Roehrig, University of Minnesota-Twin Cities, USA
Jeanna Wieselmann, Southern Methodist University, USA

NARST Connects

26-Mar-25, 10:45 AM-12:15 PM
Location: Baltimore 5

Discussion Session

This is a time for conference attendees to connect and discuss professionally related topics of their choosing. There are no designated presenters or moderators. Participants are expected to adhere to the NARST Program Code of Conduct.

Instructor Supports and Strategies for Implementing Student-Centered Instruction

Strand 5: College Science Teaching and Learning (Grades 13-20)
26-Mar-25, 9:00 AM-10:30 AM
Location: Magnolia 3

Stand-Alone Paper

Findings from the Implementation of a Learning Community for Science Faculty

Peter Cormas*, Pennsylvania Western University, USA
Min Li, Pennsylvania Western University, USA
Louise Nicholson, Pennsylvania Western University, USA
Kyle Fredrick, Pennsylvania Western University, USA
Elizabeth Steiner, RAND Corporation, USA
Sy Doan, RAND Corporation, USA
Rebecca Wolfe, RAND Corporation, USA

Stand-Alone Paper

Science Student-Teacher Perceptions of the Project-Based Learning (PjBL) Model: A Phenomenological Study with Graduate-Level Students

Isabel Delgado*, University of Puerto Rico-Rio Piedras, Puerto Rico
Emanuel Santos*, University of Puerto Rico-Rio Piedras, Puerto Rico

Stand-Alone Paper

Planning to Fail: Teaching Strategies to Navigate Failure-Related Research Challenges in an Introductory Biology CURE

Joseph Harsh*, James Madison University, USA

Gabrielle Gauldin, James Madison University, USA
Isobel Cobb, James Madison University, USA
Sarah Coleman, James Madison University, USA
Emma Powell, James Madison University, USA
Charlotte Stewart, James Madison University, USA
Julie Cumins, James Madison University, USA
Brett Chappell, James Madison University, USA
Lisa Corwin, University of Colorado - Boulder, USA
Oliver Hyman, James Madison University, USA

Stand-Alone Paper

Exploring Instructor Autonomy Support in Student-Centered College Biology Classrooms
Kimberly Pigford*, North Carolina Agricultural and Technical State University, USA
Miriam Ferzli, North Carolina State University, USA
Margaret Blanchard, North Carolina State University, USA

Empowering agency to support Teaching and Learning
Strand 7: Pre-service Science Teacher Education
26-Mar-25, 9:00 AM-10:30 AM
Location: Baltimore 2

Stand-Alone Paper

Empowering Future Educators: Pre-Service Elementary Teachers' Self-Efficacy related to Equitable Science Instruction

Lillian Bentley*, Georgia State University, USA

Stand-Alone Paper

Empowering International Science Teacher Candidates (ISTC) to Become Agentive Contributors
Moyu Zhang*, Indiana University, USA

Stand-Alone Paper

Agency and the two-worlds problem: What emerges from an asset-based understanding of preservice teachers' learning.

Ryan Coker*, Florida State University, USA
Lama Jaber, Florida State University, USA
Sherry Southerland, Florida State University, USA

Stand-Alone Paper

A Framework for Supporting Reform-Oriented Storyline Instruction in Preservice Science Methods Courses
Benjamin Lowell*, New York University, USA

Sage Andersen, University of Texas at Austin, USA
María González-Howard, University of Texas at Austin, USA

Epistemic Orientations and Scientific Sensemaking

Strand 7: Pre-service Science Teacher Education
26-Mar-25, 9:00 AM-10:30 AM
Location: Baltimore 1

Stand-Alone Paper

Preservice science teacher educators' language orientations for scientific sensemaking

María González-Howard*, The University of Texas at Austin, USA

Sage Andersen, The University of Texas at Austin, USA

Leticia Garza, The University of Texas at Austin, USA

Nazia Tasnim, The University of Texas at Austin, USA

Stand-Alone Paper

PISTEMIC ORIENTATIONS OF PRE-SERVICE SCIENCE TEACHERS IN A SCIENCE METHODS COURSE

Yetunde Adaramola*, Washington State University, USA

Omowumi Frieyo*, Washington State University, USA

Patrick Ochieng*, Washington State University, USA

Andy Cavagnetto, Washington State University, USA

Stand-Alone Paper

Secondary Pre-Service Science Teachers' Learning to Use Students' Ideas

Nessrine Machaka*, University of Illinois at Urbana Champaign, USA

Christina Krist*, Stanford University, USA

Stand-Alone Paper

Examining how teachers support students' equitable science sensemaking: A review of the literature from 2012-2024

Carrie-Anne Sherwood*, Southern Connecticut State University, USA

Amanda Benedict-Chambers*, Missouri State University, USA

Transforming Teacher Perspectives for Innovative Science Education Implementation

Strand 8: In-service Science Teacher Education

26-Mar-25, 9:00 AM-10:30 AM

Location: Annapolis 3

Stand-Alone Paper

Shifting Teachers' Conceptions from Models of to Models for: Curriculum Materials, Professional Development, and Implementation

Katherine Glover*, North Carolina State University, USA

Grace Carroll, North Carolina State University, USA

Jobie White, North Carolina State University, USA

Elizabeth Kluckman, North Carolina State University, USA

Soonhye Park, North Carolina State University, USA

Laura Chalfant, North Carolina State University, USA

Scott Ragan, North Carolina State University, USA

Jason Painter, North Carolina State University, USA

Stand-Alone Paper

Investigating the Support for Science Teacher Noticing on Reform-based Practices

Yuxi Huang*, University of California, Irvine, USA

Joseph Deluca, University of Georgia, USA

Ella Yonai, University of Georgia, USA

Xinyu He, University of Georgia, USA

Elizabeth Ayano, University of Georgia, USA

Julie Luft, University of Georgia, USA

Brooke Whitworth, Clemson University, USA

Stand-Alone Paper

Cultivating Teachers' Asset-Based Orientation for Implementing 3D Assessments

Miry Tekkumru-Kisa*, RAND, USA

Jill Wertheim*, WestEd, USA

Jennifer Richards, Northwestern University, USA

Stand-Alone Paper

Exploring teachers perceptions and beliefs about implementing socio-scientific issues using the Repertory Grid Technique

Yael Shwartz, Weizmann Institute of Science, Israel

Emil Eidin*, University of Wyoming, USA

Asaf Salman, Weizmann Institute of Science, Israel

Evolving Partnership to Advance Earth Science Across a Large District's Biology, Chemistry, and Physics Courses

Strand 10: Curriculum and Assessment

26-Mar-25, 9:00 AM-10:30 AM

Location: Magnolia 1

Related Paper Set

The Evolution of Teacher Collaboration and Leadership in a Research-Practice Partnership

Alan Berkowitz*, Cary Institute of Ecosystem Studies, USA

Kevin Garner, Baltimore City Public Schools, USA

Edmund Mitzel, Baltimore City Public Schools, USA

Beth Covitt, University of Montana, USA

Angela Hood, Cary Institute of Ecosystem Studies, USA

Carolyn Parker, American University, USA

Lauren Browning, George Washington University, USA

Jonathon Grooms, George Washington University, USA

Related Paper Set

Teachers Views About Integrating Earth Science Into High School Biology, Chemistry and Physics Curriculum

Lauren Browning*, George Washington University, USA

Annie Caires, University of Montana, USA

Beth Covitt, University of Montana, USA

Jonathon Grooms, George Washington University, USA

Related Paper Set

Partnership Participation and Teachers Changing Views of Reform Science Teaching

Jonathon Grooms*, George Washington University, USA

Lauren Browning*, George Washington University, USA

Annie Caires, University of Montana, USA

Beth Covitt, University of Montana, USA

Alan Berkowitz, Cary Institute of Ecosystem Studies, USA

Related Paper Set

Cultivating Assessment Elements to Support 3D Learning Within a Complex District Landscape

Beth Covitt*, University of Montana, USA

Kevin Garner, Baltimore City Public Schools, USA

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**Explorations of Positioning Theory
Constructs in Science Education
Research Centering Equity and
Justice**

**Strand 11: Cultural, Social, and Gender
Issues**

26-Mar-25, 9:00 AM-10:30 AM

Location: Annapolis 4

Symposium

*Explorations of Positioning Theory
Constructs in Science Education
Research Centering Equity and Justice*

Maria Varelas*, University of Illinois
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Columbia University, USA

Maria Rivera Maulucci*, Barnard College,
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Xi "CiCi" Yu, Boston University, USA

Maria Olivares, Boston University, USA

Ferdous Tououi, University of Montreal,
Stephanie Bates Spezza, University of
Illinois Chicago, USA

***Understanding Ethical Decision-
Making Through Equity Frames
Across Science Contexts***

**Strand 11: Cultural, Social, and Gender
Issues**

26-Mar-25, 9:00 AM-10:30 AM

Location: Annapolis 1

Related Paper Set

*How Design Dilemmas are Helping
Teachers Grapple with Racial and
Social Equity in Science Curriculum*

Katarzyna Pomian Bogdanov*,
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Related Paper Set

*Ethical commitments to equitable
and inclusive teaching of pre-service
teachers*

Ronan Rock*, University of Illinois Chicago,
USA

Related Paper Set

*Ethical and Historical Considerations
as Design Dilemmas in Transfer Task
Development*

Nicole Vick*, Northwestern University, USA
Daniel Voss, Northwestern University, USA

***Cognitive and Emotional Aspects in
STEM Education***

**Strand 12: Technology for Teaching,
Learning, and Research**

26-Mar-25, 9:00 AM-10:30 AM

Location: Baltimore 5

Stand-Alone Paper

*How Textual Features Interact with
Cognitive Factors: Environmental
Cognitive Augmentation Using AI*
Richard Lamb*, University of Georgia, USA

Christine Brugh, Laboratory of Analytic Sciences, USA

Lori Wachter, Laboratory of Analytic Sciences, USA

Steohen Shauger, Laboratory of Analytic Sciences, USA

Bo Light, Laboratory of Analytic Sciences, USA

Kenneth Thompson, Laboratory of Analytic Sciences, USA

Stand-Alone Paper

First-year STEM undergraduates at an HBCU: Less Course Tech, More Role Stress

Elizabeth Deimeke*, Clark Atlanta University, USA

Renee Schwartz, Georgia State University, USA

Stand-Alone Paper

Integrating Harleybot with CTCA: Enhancing Learners' Retention, Motivation, and Attitudes in ICT and STEM Education

Alli Abdurrazaq, Lagos State University, Nigeria

Olugbenga Akindoju, Lagos State University, Nigeria

Hakeem Olatoye, Lagos State University, Nigeria

Peter Okebukola, Lagos State University, Nigeria

Sanni Rasheed, Lagos State University, Nigeria

Advancing Science Pedagogy: Insights from Inquiry, Practices, and Differentiated Approaches

Strand 2: Science Learning: Contexts, Characteristics and Interactions

26-Mar-25, 10:45 AM-12:15 PM

Location: Camellia 1

Stand-Alone Paper

Science Content to Practice: Investigating Middle-Grade Students Views About Inquiry and Science and Engineering Practices

Alex St. Louis*, Augusta University, USA

Savannah Hayes*, University of Houston, USA

Taylor Kate Guerrero*, Augusta University, USA

Stand-Alone Paper

A Systematic Review of High Impact Review Studies in STEM Education

YURDAGÜL BOĞAR*, Hakkari University, Turkey

Stand-Alone Paper

Model-based Inference as a Source of Agency in Scientific Explanation

Jonathan Shemwell*, University of Alabama, USA

Daniel Capps*, University of Georgia, USA

Daniel Pimentel*, University of Alabama, USA

Stand-Alone Paper

Comics in STEM aren't Superior to Traditional Worksheets

Marc Rodemer*, University of Duisburg-Essen, Germany

Nils Ullenboom, University of Duisburg-Essen, Germany

New Approaches to Understanding

Classroom Culture in Science

Classrooms

Strand 2: Science Learning: Contexts, Characteristics and Interactions

26-Mar-25, 10:45 AM-12:15 PM

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Related Paper Set

Simultaneously addressing epistemic and relational aspects of classroom activity: A teacher's opportunities and challenges

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Children's Voices on Classroom Norms: Understanding Second Graders' Experiences in Collaborative Science Learning

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How college students experience a physics course designed to support collective learning

Eric Kuo*, University of Illinois Urbana-Champaign, USA

Christina Krist, Stanford University, USA

Identity, Belonging, and Cultural Capital in STEM

Strand 5: College Science Teaching and Learning (Grades 13-20)

26-Mar-25, 10:45 AM-12:15 PM

Location: Magnolia 3

Stand-Alone Paper

Assessing Identity, Belonging, and Impostorism for Interdisciplinary Graduate Education

M. Gail Jones*, NC State University, USA

Alicia Fischer, NC State University, USA

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Graduate STEM Students as Role Models for High School Students

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Bridging families: Leveraging first-generation, familial, and filial piety cultural capitals in Physics classrooms

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**Innovations In Quantitative
Assessment Frameworks And
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Biology Education**

**Strand 5: College Science Teaching and
Learning (Grades 13-20)**

26-Mar-25, 10:45 AM-12:15 PM

Location: Magnolia 1

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*Can Large Language Models
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*Quantitative frameworks for assessing
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**Description of a Place-Based,
Informal Science Learning
Experience at the Great Dismal
Swamp**

**Strand 6: Science Learning in Informal
Contexts**

26-Mar-25, 10:45 AM-12:15 PM

Location: Baltimore 4

Related Paper Set

*A Literature Review of African
American Informal STEM Learning*
Jomo Mutegi*, Old Dominion University,
USA
Seth Cudjoe, Old Dominion University,
USA

Related Paper Set

*Using Socially Transformative
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*Exploring the Impact of an Informal
STEM Learning Experience through
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Umar Adams, Lagos State University,
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*Participant Voices: What I Learned as
an Intern in the Great Dismal Swamp.*

Mujibat Akorede*, Old Dominion
University, USA

Liliana Boyd, Lakeland High School, USA

Pearl Kmutia, Kings Fork High School, USA

Kay Adams, Friends of the Great Dismal
Swamp National Wildlife Refuge, USA

Jomo Mutegi, Old Dominion University,
USA

Approaches of Developing Self-efficacy for STEM Teaching and Learning

Strand 7: Pre-service Science Teacher Education

26-Mar-25, 10:45 AM-12:15 PM

Location: Baltimore 1

Stand-Alone Paper

What is STEM? Preservice Elementary Teachers' Conceptions of Integrated STEM Instruction

Jeanna Wieselmann*, Southern Methodist
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Deepika Menon, University of Nebraska -
Lincoln, USA

Brynn Price, Southern Methodist
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Allison Johnson, University of Nebraska -
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*Analyzing Item Endorsement Difficulty
of the Engineering Teaching Efficacy
Beliefs Instrument Using Wright Maps*

Ezgi Yesilyurt*, Weber State University,
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*Improving STEM-EL Instruction:
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Specialized Teacher Training Program
for Future Educators*

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Investigating Elementary Preservice Teachers' STEM Self-Efficacy
Arzu Tanis Ozcelik*, Aydin Adnan Menderes University, Turkey

Approaches to Exploring Preservice Teachers' Learning and Teaching
Strand 7: Pre-service Science Teacher Education
26-Mar-25, 10:45 AM-12:15 PM
Location: Baltimore 2

Stand-Alone Paper
Supporting Preservice Teachers' Lesson Planning Competence with a Focus on Coherence
Marcus Schiolkko, Chemistry Education, Germany
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Stand-Alone Paper
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Cory Buxton, Oregon State University, USA

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Strand 8: In-service Science Teacher Education
26-Mar-25, 10:45 AM-12:15 PM
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Related Paper Set
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Strand 11: Cultural, Social, and Gender Issues
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Strand 11: Cultural, Social, and Gender Issues

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Climate Justice
Strand 14: Environmental Education and Sustainability
26-Mar-25, 10:45 AM-12:15 PM
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Stand-Alone Paper

Elementary Climate Education: A Framework for Including Climate Justice in Climate Emergency Lessons
Hong Tran*, Purdue University, USA
Joseph DeLuca, University of Georgia, USA
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De-Naturalizing Climate Disasters Through Justice-Oriented Science Education
Wonyong Park*, University of Southampton, United Kingdom
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Math as a Tool for Advocacy: Teachers' Quantitative Moral Moves During Climate Justice Activities
Helen Fitzmaurice*, UC Berkeley, USA
Michelle Wilkerson, UC Berkeley, USA
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