



S²ERC

SOUTHEASTERN STEM EDUCATION
RESEARCH CONFERENCE

2025



JANUARY 10-11, 2025

HOSTED BY

THE UNIVERSITY OF ALABAMA AT BIRMINGHAM

Birmingham, Alabama



19th Annual Southeastern STEM Education Research Conference

January 10-11, 2025

Friday, January 10

12:00 pm Registration Opens – Heritage Hall Lobby

12:00 pm – 4:30 pm Poster Session Setup – Heritage Hall Lobby

1:30 pm – 3:00 pm Early Career Panel – Heritage Hall, Room 104

2:00 pm – 4:00 pm Refreshments – Heritage Hall Lobby

3:30 pm – 5:00 pm Parallel Oral Sessions (Sessions 1 and 2) – Heritage Hall

Oral Presentations – Session 1 (STEM Education)

Heritage Hall, Room 104 Facilitator: Dr. Brenna Tucker

3:30 pm Introductory Remarks

3:35 pm An Examination of the Efficacy of an Aerospace Living Learning Community,
Timothy Rosser (Middle Tennessee State University)

3:55 pm Specifications Grading in Data Science Education: Implementation and
Evaluation of Proposed Student Outcomes, *Brandon Yik (University of Georgia),*
Loreto P. Alonzi III, Brian M. Wright, & Marilynne Stains (University of Virginia)

4:15 pm Increasing Success and Retention of Female Students in Computer Science by
Enhancing Two Key Factors: Math Proficiency and Programming Skills,
Yi Gu, Jaishree Ranganathan, & Lu Xiong (Middle Tennessee State University)

4:35 pm Experimental Measurement and Establishment of Communication Metrics
Using a Highly Interactive and Visually Enhance Robot Platform,
Samina Upama & Bruce Jo (Tennessee Tech University)

Oral Presentations – Session 2 (STEM Education)

Heritage Hall, Room 121 Facilitator: Dr. Daniel Siao

3:30 pm Introductory Remarks

3:35 pm Exploring How Low-Income Students Navigate Inequities in Undergraduate
Research Experiences, *Emma Goodwin (University of Georgia), Sailor Deredt,*
Jasmine Goode, Bec Kalfus, Gailan Khanania, Laura Pang, & Sara Brownell
(Arizona State University)

3:55 pm Complex Systems, Emergence, and Conceptualizations of Learning,
Jonan Donaldson, (University of Alabama at Birmingham)

4:15 pm **STEMMING the Tide: Empowering Youth to Meet Coastal Environmental Challenges**, *Kate Hayden (University of Montevallo), Vincent T. Gawronksli (Birmingham-Southern College), Ronald Hazelhoff & Mark Meade (University of Alabama at Birmingham), Desiree' Melonas (University of California, Riverside), Danielle Haskett-Jennings (University of Montevallo), Kelly Russell (Troy University), Louanne Jacobs (i3Academy)*

4:35 pm **Science Identity Development of First-Generation College Students in Two Learning Assistant-Supported Classrooms**, *Kathryn Hosbein, Oluwatobiloba Ayangbola, & Sarah Bleiler-Baxter (Middle Tennessee State University)*

5:00-6:00 pm - Poster Session – Heritage Hall Lobby

1. **An Exploration of Thwarted Belongingness and Perceived Burdensomeness Among Undergraduate Agriculture Student**, *Carly Altman & Chaney Mosley (Middle Tennessee State University)*
2. **Catalyzing Departmental Change: A Literature Review of Barriers, Drivers, and Framing**, *Cassandra Mohr, Cory Wang, Sarah Bleiler-Baxter, Mary E. Foley, Alyssa S. Freeman, Aspen Malone, Andrew R. Puente, Grant E. Gardner, & Gregory T. Rushton, (Middle Tennessee State University)*
3. **Chemistry Bridge: An Outreach Program for Incoming High Schoolers**, *Corey Burns, Tyrese J. Boddie, Riley P. Cooper, Zachary B. Dotson, & Anna L. Wong, (University of Alabama at Birmingham)*
4. **CURE Inception: Teaching Undergraduate Biology Students Science Communication About Culturally Controversial Topics by Having Them Research How Undergraduates Currently Communicate About Culturally Controversial Topics**, *Mary Foley & Elizabeth Barns (Middle Tennessee State University)*
5. **Developing Data Science Through Community Engagement: MVP Model**, *Juan Carlos Gonzalez-Roman & Lynn Hodge (University of Tennessee, Knoxville)*
6. **Developing Instruments to Evaluate and Improve Undergraduate Interpersonal Science Communication About Culturally Controversial Science Topics**, *Erin Rowland-Schaefer, Kate Coscia, Donye Asberry, & M. Elizabeth Barnes (Middle Tennessee State University)*
7. **Development of Computational Thinking Using TI-Innovation Rovers in High School Mathematics**, *Emily McDonald (University High and University of Tennessee, Knoxville)*
8. **Evaluating the Effectiveness of an Integrative Education Implementation in Biology Classrooms on Increasing Student Sense of Belonging**, *Christel Whitehead & Peggy Biga, (University of Alabama at Birmingham)*
9. **Exploring the Impact of Project-Based Learning in Theory of Flight Classes: A Case Study on Glider Performance as a Predictor of Student Success**, *Collin McDonald (Middle Tennessee State University) Daniel Saio (Auburn University)*
10. **Faculty Perspectives on Using Learning Assistants (LAs) in Undergraduate Introductory Science Classes**, *Monsour Zakariyah & Katy Hosbein (Middle Tennessee State University)*
11. **Libraries Count: Initial Impacts of a Virtual Learning Program for Library Staff Focused on Early Math with Young Children and their Families from Diverse Backgrounds**, *Alissa Lange (East Tennessee State University) Bharat Mehra (University of Alabama)*

12. **Measuring STEM Department Teaching Culture: A Survey Developed Using Self-Determination Theory**, *Alyssa S. Freeman, Mary E. Foley, Sarah Bleiler-Baxter, Aspen Malone, Cassandra Mohr, Andrew R. Puente, Cory Wang, Gregory T. Rushton, & Grant E. Gardner (Middle Tennessee State University)*
13. **Partnerships That Live Beyond Graduation Give New Teachers a Feeling of Belonging and the Stamina to Stay**, *Jill Chambers, Tina Hendrickson, Michael J. Wyss, & Sandra McKell (University of Alabama at Birmingham)*
14. **STEM-STEAM Engagement for Advancing Biomaterials**, *Karen Boykin (University of Alabama at Birmingham), Jonathan R. Bonner, Brian Pillay, Haibin Ning, & Derrick Armstrong (University of Alabama at Birmingham), Coleman Beale & Gabriella Gurau*
15. **Student Perceptions of Learning Gains in Revised General Education Science Course**, *Tamera Klingbyll (Lipscomb University)*
16. **Students Who Prefer In-Person Tests Outperform their Online Peers in Organic Chemistry**, *Abby Beatty & Abby Esco (Auburn University), Ashley Curtiss (University of Alabama at Birmingham), Cissy Ballen (Auburn University)*
17. **The Beca Embajadores Global Education Program: Assessment and Implications for Self-Efficacy and Interest in Graduate School**, *Wilson Gonzalez-Espada & Jorge Ortega-Moody (Morehead State University), Neftalí Villanueva Pérez (National Polytechnic Institute), Nilesh N. Joshi & Miescha Bycura (Morehead State University)*
18. **Grit, Persistence Strategies, and Retention Recommendations from the Viewpoint of USAFA Graduating Cadets in STEM**, *Wilson Gonzalez-Espada (Morehead State University), Capt. Scott T. Alsid, Maj. Daniel O'Keefe, Maj. Robert Lloyd, & Lt. Col. David C. Meier (U.S. Air Force Academy)*
19. **The Disconnect Between Undergraduate Standard Mathematics and Modern Applied Mathematics: A Literature Review**, *Cory Wang (Middle Tennessee State University)*
20. **Towards Leveraging AI to Provide Automatic Code Review in a Software Engineering Course**, *Esteban Parra & Sophia Willingham (Belmont University)*
21. **Undergraduate Engineering Project in Embedded Systems Course Guided by External Collaboration and Needs**, *Abidin Yildirim, Jonathan D. Kinney, Ryan L. Trudeau & Scott Brande (University of Alabama at Birmingham)*

6:30 pm – 8:15 pm Dinner and Keynote Presentation – Alumni House

**Keynote Speaker - Dr. Michael Saag
University of Alabama at Birmingham**

8:30 – 10:00 pm Social Hour – Monday Night Social Club

Saturday, January 11

7:30 am - Close Registration – Heritage Hall Lobby

8:00 am – 9:00 am Breakfast – Heritage Hall Lobby

9:00 am – 11:45 am Parallel Oral Sessions – Heritage Hall

Oral Presentations – Session 3 (Biology and Chemistry Education)

Heritage Hall, Room 104 Facilitator: Dr. David Crisostomo

9:00 am Introductory Remarks

9:05 am From Microevolution to the Common Ancestry of Life: The Role of Religiosity, Understanding, and the Context/Scale of Evolution in Students' Acceptance of Evolution, *Rahmi Aini, Madison Stewart & M. Elizabeth Barnes (Middle Tennessee State University)*

9:25 am One Lesson on Science Communication Can Improve Undergraduate Biology Students' Communication About Culturally Controversial Science Topics (CCSTs), *Katie Coscia, Donye Asberry, Casey Epting, Alexa Summersill, & M. Elizabeth Barnes (Middle Tennessee State University)*

9:45 am The Biology Café: Learning in a Social Setting, *Mickie Powell, Megan Gibbons, Cynthia Tant & Ketia Shumaker (University of Alabama at Birmingham)*

10:05 am Navigating Disclosure: How Does Context Affect the Decisions of Neurodivergent STEM Students During Group Work? *Mariel Pfeifer & Mason Barker (University of Mississippi), Abigail Graham (Thomas Jefferson University), Madison Greene, Kate Leonard, & Maggie Vander Sys (University of Mississippi) & Stephen Podowitz-Thomas (Thomas Jefferson University)*

10:25 am Break

10:45 am Exploring the Association Between Communicating About Spectral Data and Acute Awareness of Stigma Attached to One's Gender Among Women in Postsecondary Organic Chemistry Courses, *Megan Connor, Ally Parvin & Alex Browning (Samford University)*

11:05 am Developing the Future of Safer MRI Contrast Agents: An Advanced Undergraduate Chemistry Lab Experience, *Aaron Alford (University of Alabama at Birmingham), Samith Jayawardana (University of Alabama), Zachary Cuny (University of Alabama at Birmingham), Gayan Wijeratne (University of Alabama) & Mark Bolding (University of Alabama at Birmingham)*

11:25 am Beg, Borrow, and Steal- Adapting Existing Games for Chemistry Courses, *David Crisostomo (Auburn University)*

Oral Presentations – Session 4 (Engineering and Math Education)

Heritage Hall, Room 121 Facilitator: Dr. Ash Curtiss

- 9:00 am** **Introductory Remarks**
- 9:05 am** **From Silos to Synergy: Exploring the Connection Between Foundry-Guided Activities and Holistic, Interdisciplinary Engineering Education**, *Andrea Arce-Trigatti, Pedro E. Arce & J. Robby Sanders (Tennessee Tech University)*
- 9:25 am** **High School Student Rankings of Hands-On Activities to Introduce Electrical Engineering During Participation in a Weeklong Residential STEM Camp**, *Todd Freeborn & Andrea Ziegler (University of Alabama)*
- 9:45 am** **Undergraduate Views of the Nature of Mathematics**, *Christopher Bonnesen & Jeremy Strayer (Middle Tennessee State University)*
- 10:05 am** **Measurement View Reasoning: How do Preservice Teachers Use Representational Approaches to Think About Fraction Division?** *Kingsley Adamoah & Jeremy Strayer (Middle Tennessee State University)*
- 10:25 am** **Break**
- 10:45 am** **Undergraduate Students' Nature of Mathematics in an Introduction to Proof Course**, *Jordan Kirby (Francis Marion University)*
- 11:05 am** **Enhancing Student Engagement and Teacher Perceptions Through Desmos Classroom Activities in High School Mathematics**, *Emily McDonald (University High and University of Tennessee, Knoxville)*
- 11:25 am** **Exploring the Impact of Automated Assessments in a Quantitative Methods Course**, *Raluca Clendenen & Brad Schleben (Belmont University)*

12:00 pm–1:00 pm **Lunch – Heritage Hall Lobby**

1:00 pm– 3:00 pm **Parallel Oral Sessions – Heritage Hall**

Oral Presentations – Session 5 (Science Education)

Heritage Hall, Room 104 Moderator: Christel Whitehead

- 1:00 pm** **Introductory Remarks**
- 1:05 pm** **Comparison of Student Reflections on their Undergraduate Research Experiences in Chemistry and Biology**, *Chazzidy Harper (Kennesaw State University)*
- 1:25 pm** **Undergraduate Student Conceptions & Sources of Knowledge of Reproduction & Pregnancy**, *Staci Johnson, John T. Locke (Southern Wesleyan University) & Riley Young (Mississippi State University)*
- 1:45 pm** **Ongoing Findings from a Systematic Review of the Identity Negotiations of Doctoral Students in the Natural Sciences**, *Stephanie Berg, Case Kennedy, Avery Hodges & Mariel Pfeifer (University of Mississippi)*
- 2:05 pm** **Closing Remarks**

Oral Presentations – Session 6 (Chemistry and STEM Education)
Heritage Hall, Room 121 Moderator: Dr. Rachel Prado

- 1:00 pm** **Introductory Remarks**
- 1:05 pm** **Building an Immersive and Inclusive Organic Chemistry Learning Experience**, *J. Rachel Prado (Auburn University), Vanessa Falcao, Allie Brandriet, Ali Sattari*
- 1:25 pm** **Could Exam Retake Policies Serve as an Avenue for Advancing Diversity, Equity, and Inclusion in Chemistry Education?** *Tasneem Siddiquee (Tennessee State University) & Jesmin Akther (Nashville State Community College)*
- 1:45 pm** **Mathematically Minded: A Case Study Exploring a Foundry-Guided Course to Improve STEM Students' Critical Thinking Skills through a Historical Markers Database Activity**, *Andrea Arce-Trigatti, Anna Donalies, Gideon Eduah & Ada Haynes (Tennessee Tech University)*
- 2:05 pm** **STEM Graduate Teaching Assistants: Exploring the Relationship Between Autonomy, Discontentment, and Self-Efficacy**, *Alyssa Freeman, Beari Jangir, Marco Said, Chelsea Rolle, Kadence Riggs & Grant E. Gardner (Middle Tennessee State University)*
- 2:25 pm** **Levers and Barriers to Graduate Students Teaching Professional Development (GS TPD): Results from Expert Consensus Using Delphi Methodology**, *Erik Akuoko & Grant E. Gardner (Middle Tennessee State University)*
- 2:45 pm** **Closing Remarks**