

18th Annual Southeastern STEM Education Research Conference

January 12-13, 2024

Friday, January 12, 2024

11:30am – 12:30pm Tennessee STEM Education Leadership Council (TNSEL) – Science Building Room 1006

11:30am – 12:30pm Tennessee Association of Mathematics Teacher Educators – Science Building Room 1003

12:00pm Registration Opens – Science Building Atrium

12:00pm – 4:30pm Poster Session Setup – Science Building Atrium

1:30pm – 3:00pm Early Career Panel – Science Building Room 1006

2:00pm – 3:30pm Refreshments – Science Building Atrium

3:15pm – 4:15pm Session 1

Engineering Education – Science Building Room 1003 – (Facilitator: Lori Klukowski)

- **Improving Undergraduate Success Through Effective Critical Thinking**, *Nathan Duran-Ledezma, Joseph Biernacki, Twanelle Majors, Stephanie Wendt, & Indranil Bhattacharya (Tennessee Technological University)*
- **Pairing Sustainability with Innovation: Measuring Student Performance in a Foundry-Guided Intervention**, *Dipendra Wagale, Andrea Arce-Trigatti, Pedro E. Arce, & J. Robby Sanders (Tennessee Technological University)*

STEM Education – Science Building Room 1190 – (Facilitator: Samantha Fletcher)

- **Examining the Relationship between Classroom Assessment and Project Based Learning**, *Collin McDonald (Middle Tennessee State University) & Daniel Siao (Auburn University)*
- **IMAGES of STEM: Implications for Cohort Learning and Professional Development in Undergraduate STEM Education**, *Wanda Payne & Martene Stanberry (Tennessee State University)*
- **The Case-Based Active Science Education (CASE) Mentoring Network**, *Rebecca Seipelt-Thiemann (Middle Tennessee State University), Nancy Maroushek Boury and Patrick Armstrong (Iowa State University), Brock Couch (University of New Hampshire), Jim Haynes (Middle Tennessee State University), Olena James (Belmont University), Sayali Kukday (Iowa State University), Zach Grimes (Crowley's Ridge College), Audrey McCombs (Sandia National Labs), Nick Peters (Iowa State University) & Maartje Van den Bogaard (University of Texas at El Paso)*

STEM Education – Science Building Room 1191 – (Facilitator: Katie Coscia)

- **A Quantitative Ethnography of Computer Scientist Identity**, *Tim Ransom (Clemson University)*
- **STEM for All: TVI Perspectives**, *Lisa Salvato (Tennessee Technological University)*

4:30–5:45pm Poster Session – Science Building Atrium

Easel # Poster Title, Author(s), and Affiliations

- 1 • **A Conversation with Bluebot: Promoting STEM Education via Chatbots**, *Zain Al-Saad & Tisha Gaines (Belmont University)*
- 2 • **Analysis of Demographic and Experiential Interactions in Quantitative General Education USAFA Courses and Their Impact on STEM Attrition**, *Wilson González-Espada (Morehead State University), Capt. Scott Alsid, Maj. Daniel O'Keefe, Lt. Col. David Meier, & Maj. Christopher M. Francis (United States Air Force Academy)*
- 3 • **Analysis of Performance on the Praxis Biology Content Knowledge Test at the Category-level**, *Andrea Reeder & Heather Green (Middle Tennessee State University)*
- 4 • **Analyzing End-of-chapter Questions and In-chapter Sample Problems in General Chemistry Textbooks for Diversity of Real-world Applications and Cultural Perspectives**, *Jennifer Stockdale & Kathryn Hosbein (Middle Tennessee State University)*
- 5 • **Computing Education in Ghana: A Preliminary Investigation**, *Crystal Davis & Ryan A. Nivens (East Tennessee State University)*
- 6 • **Examining Students' Epistemic Knowledge of Atomic Structure Models in Chemistry**, *Salawat Lateef (University of Louisville), Emmanuel E. Jimenez, & Morgan Balabanoff*
- 7 • **Examining the Impact of Design-based Research Methods on Project Implementation**, *Skylar Hubbarth, Anna G. Hunter, Shannon Conner & D. Matthew Boyer (Clemson University)*
- 8 • **Exploring the Impact of a Science Communication Lesson on Undergraduate Biology Students' Ability to Communicate about Culturally Controversial Science Topics**, *Katie Coscia, Casey Epting, Alexa Summersill, M. Elizabeth Barnes (Middle Tennessee State University)*
- 9 • **Initial Impacts of a Community-engaged Learning Focus on Pre-service Teachers in an Early STEM Collaboration**, *Amie Perry & Alissa Lange (East Tennessee State University)*
- 10 • **Interdisciplinary Assessment of Student Thinking About Variability**, *Fonya Scott (Middle Tennessee State University), Rebecca Klukowski (University of Louisville), Kaytlin Campbell (Middle Tennessee State University) & Oscar Meza-Abarca (Middle Tennessee State University)*
- 11 • **Investigating Factors Influencing Science Student Retention**, *Hayley Benson & Morgan Balabanoff (University of Louisville)*
- 12 • **Investigating Pre-health Students' Science Identity and the Factors That Influence Them to Change Programs or Tracks**, *Taylor Humphreys & Morgan Balabanoff (University of Louisville)*
- 13 • **Investigating The Utility of and Barriers to Educational Resources for Students in STEM**, *Claire Ward & Morgan Balabanoff (University of Louisville)*

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4:30–5:45pm Poster Session – Science Building Atrium (continued)

Easel # Poster Title, Author(s), and Affiliations

- 14 • **Lessons Learned from the First Five Years of VolsTeach for Appalachia: Teacher Recruitment of Pre-Service STEM Community College Students**, *Nick Kim, Carlos Gonzalez & Lynn Hodge (University of Tennessee-Knoxville)*
- 15 • **Lessons Learned: TTU STEM Majors for Rural Teaching (SMaRT) Noyce Scholarship Program**, *Holly Anthony & Stephen Robinson (Tennessee Tech University)*
- 16 • **Meaningful Mathematics with Coding - Teacher Training and Collaboration with Incorporating Computer Science Principles in High School Mathematics**, *Emily McDonald (Hamilton County Schools & University of Tennessee-Knoxville)*
- 17 • **Measuring Goal Alignment Within a Community of Research Teams**, *Thomas Stiles (University of Montana Western)*
- 18 • **Metacognition in Assessing Evolutionary Understanding: A Consideration**, *Rahmi Aini & M. Elizabeth Barnes (Middle Tennessee State University)*
- 19 • **Parent’s Early Home Math Support Does Not Correlate Between Survey and Interview Responses**, *Brooke Poston, Camille Msall, Ashli-Ann Douglas & Bethany Rittle-Johnson (Vanderbilt University)*
- 20 • **Parental Mathematics Support Through Pattern Activities and Talk**, *Alexis Richmond, Camille Msall, Ashli-Ann Douglas, Faith Logan & Bethany Rittle-Johnson (Vanderbilt University)*
- 21 • **Partnership to Develop Fermentation Science as a Curricular Enhancement to Basic Undergraduate STEM Classes**, *Tony Johnston, Terry Goodin & Ginger Rowell (Middle Tennessee State University)*
- 22 • **Preparing Area Pipeline Students: Evaluation of a STEM Summer Engineering Bridge Program**, *Selvam B. Pillay, K. Madeline Boykin, Jeffrey W. Holmes, Haibin Ning, Krusha Patel, Mubenga N. Nkashama & Jonathan Bonner (University of Alabama at Birmingham)*
- 23 • **Psychometrics of a Researcher-made Worked Examples Assessment for Math Word Problem Solving**, *Vishakha Agrawal, Anna H. Miller, Hailey Kepiro, Marcia A. Barnes (Vanderbilt University) & Sarah Powell (University of Texas at Austin)*
- 24 • **The Impact of Two Sequential CURES On Student Outcomes in an Introductory Biology Laboratory Course**, *Emma Throneburg, Rachel Pigg, Natalie Christian, Jeffery Masters & Mikus Abolins-Abols (University of Louisville)*
- 25 • **U.S. Mathematics Major Retention and Attrition: A Survey Study**, *Amanda Lake Heath & Sarah K. Bleiler-Baxter (Middle Tennessee State University)*
- 26 • **Use Of Smartphone Sensors to Enhance Lab Activities in an Introductory Physics Course**, *David Meier & Kimberly de la Harpe (United States Air Force Academy)*

6:00–8:00pm Dinner and Keynote Presentation – Jamies Union Building Ballroom

- Keynote Speaker - Dr. David Drew, Claremont Graduate University

Saturday, January 13, 2024

7:30am Registration Opens – Science Building Atrium

8:00am – 9:00am Breakfast – Science Building Atrium

9:00am – 10:30am Session 2

Biology Education – Science Building Room 1006 – (Facilitator: Liz Barnes)

- **Perceptions of Conflict Between Religion and Evolution are Higher Among Atheist Undergraduate Biology Students than Christian Biology Students**, *Katie Coscia, Rahmi Q. Aini, Chloe D. Bowen (Middle Tennessee State University), Sara E. Brownell (Arizona State University), & M. Elizabeth Barnes (Middle Tennessee State University)*
- **Retaining Underrepresented Students in Biology: Outcomes of a Culturally Responsive Intervention on Perceptions of Supports and Barriers**, *Carin Smith, Artenzia Young-Seigler, Elaine Martin, Jessica J. Capretto, & Marie Hammond (Tennessee State University)*
- **The Impact of Religious Identity on The Efficacy of Evolution Instruction with Cultural Competence**, *Rahmi Aini, Alexa Summersill, Casey Epting (Middle Tennessee State University), Baylee Edwards, Sara Brownell (Arizona State University), & M. Elizabeth Barnes (Middle Tennessee State University)*

Math Education – Science Building Room 1190 – (Facilitator: Kingsley Adamoah)

- **Examining Relationships Between Secondary Teachers' Content Knowledge and Attitudinal Traits**, *Christopher Bonnesen, Jeremy Strayer (Middle Tennessee State University), Andrew Ross (Eastern Michigan University), & Yvonne Lai (University of Nebraska-Lincoln)*
- **Student Perceptions of Individual and Group Creativity in Proving**, *Amanda Lake Heath (Middle Tennessee State University)*
- **Who Wrote it Better? A Comparison of AI and Teacher Created Lessons for High School Mathematics**, *Emily McDonald (Hamilton County Schools & University of Tennessee, Knoxville)*

STEM Education – Science Building Room 1191 – (Facilitator: Heather Green)

- **Assessing the Programming Self-efficacy of Teachers through Professional Development Combining Drones and STEM Activities**, *Deborah McAllister (University of Tennessee, Chattanooga)*
- **Digital Agriculture Summer Camp and Non-formal Learning: A Comparative Analysis of the First and Second Year Camp Participant Knowledge and Postsecondary STEM Interests**, *Carly Altman, Chaney Mosley, & Song Cui (Middle Tennessee State University)*
- **Enhancing STEM Learning Environments: Exploring Professional Development Opportunities in Workshops to Improve Students' Critical Thinking Skills**, *Gideon Eduah (Tennessee Technological University), Andrea Arce-Trigatti (Tallahassee Community College), & Ada Haynes (Tennessee Technological University)*

10:30am–10:45am Break

10:45am– 12:15pm Session 3

Math Education – Science Building Room 1006 – (Facilitator: Chris Bonnesen)

- **Affordances of Self-Study Methodology for Understanding Researcher Positionality**, *Samantha Fletcher (Middle Tennessee State University)*
- **Assessing Elementary Preservice Teachers’ Knowledge for Fraction Division**, *Kingsley Adamoah & Jeremy Strayer (Middle Tennessee State University)*
- **The Interplay of Housing Instability and Mathematics during Adolescence: A Retrospective Study of Black STEM Folx**, *Sharetta Bufford & Eliza Gallagher (Clemson University)*

STEM Education – Science Building Room 1190 – (Facilitator: Heather Green)

- **Developing a Holistic Prototype to Wicked Challenges: A Theoretical Exploration of Graduate Student’s Self-Efficacy within a Foundry-Guided Experience**, *Carey Wilson, Katie Pabody, Andrea Arce-Trigatti, Pedro Arce, Sabrina H. Buer, Ada Haynes, Rufaro A. Chitiyo, J. Robby Sanders, & Troy Smith (Tennessee Technological University)*
- **Meta-Analysis of Teaching Professional Development for STEM Graduate Teaching Assistants**, *Grant Gardner, Alyssa Freeman, Chelsea Rolle, & Kadence Riggs (Middle Tennessee State University)*
- **The Relationship between Autonomy, Pedagogical Discontentment, Self-Efficacy and the Teaching Practices of Graduate Teaching Assistants**, *Alyssa Freeman, Grant Gardner, Chelsea Rolle, Kadence Riggs, & Tom Brinthaup (Middle Tennessee State University)*

STEM Education – Science Building Room 1191 – (Facilitator: Carly Altman)

- **Beyond Gender and Race: The Representation of Concealable Identities Among College Science Instructors**, *Carly Busch, Katelyn M. Cooper, & Sara E. Brownell (Arizona State University)*
- **The Influence of Cultural Perceptions in the Preference and Choice of STEM Programs**, *Priscilla Moffat (Ghana Institute of Management and Public Administration)*
- **The Influence of Near-Peer Mentoring on Undergraduate Career Goal Development in a Community of Research Teams**, *Thomas Stiles (University of Montana Western)*

12:15pm–1:30pm Lunch – Science Building Atrium

1:30pm– 3:00pm Session 4

STEM Education – Science Building Room 1190 – (Facilitator: Alyssa Freeman)

- **A Research-Based Dual Enrollment Statistics Class at ETSU**, *Maria Emilia Alfaro, John Hicks, & Anant Godbole (East Tennessee State University)*
- **Strategic Planning Platform for Engaged Regional Research and Industry Development**, *K. Madeline Boykin (University of Alabama at Birmingham), Gabriela Gurau, Robin Rogers, Jonathan Bonner (Unaffiliated), Jeff Gray, Chris Crawford (The University of Alabama), Tasha Drake (Stillman College), & Brian Pillay (University of Alabama at Birmingham)* **(continued)**

STEM Education – Science Building Room 1190 (continued)

- **Systematic Literature Review Characterizing Students’ Operational Atomic Structure Knowledge**, *Emmanuel Echeverri-Jimenez & Morgan Balabanoff (University of Louisville)*

STEM Education – Science Building Room 1191 – (Facilitator: Sarah Bleiler-Baxter)

- **Locating Holes in the Leaky Pipeline: A Quantitative Investigation into Factors and Trends Within the STEM Attrition Crisis**, *Cassandra Koevoets-Beach & Morgan Balabanoff (University of Louisville)*
- **Technology-Based Programs for Preschoolers: How Does Technology-Based Interventions Close Gaps and Increase Kindergarten Readiness When Used in Pre-K Classrooms?**, *Erica Jones & Elizabeth MacTavish (University of Tennessee, Knoxville)*
- **Using Questions to Support Student Sensemaking in an Integrated STEM Investigation**, *Lori Klukowski, R. Seth Jones & Fonya C. Scott (Middle Tennessee State University)*