18th Annual Southeastern STEM Education Research Conference
at Middle Tennessee State University
January 12-13, 2024

January 12, 2024
12:00 pm - 5:30 pm  Registration – Science Building Atrium
12:00 pm - 4:30 pm  Poster Session Setup – Science Building Atrium
1:00 pm - 2:30 pm  Early Career Panel – Science Building Room 1006
2:30 pm - 3:30 pm  Refreshments – Science Building Atrium
3:30 pm - 4:30 pm  STEM Education Oral Presentations Session 1
    (Science Building 1003, 1006, 1190, 1191)
4:30 pm-6:00 pm  STEM Education Poster Session – Science Building Atrium
6:00 pm-8:00 pm  Banquet and Keynote Speaker – James Union Building Ballroom

January 13, 2024
7:30 am            Registration Opens – Science Building Atrium
8:00 am - 9:00 am  Breakfast – Science Building Atrium
9:00 am - 10:30 am STEM Education Oral Presentations Session 2
    (Science Building 1003, 1006, 1190, 1191)
10:30 am - 10:45 am Break
10:45 am - 12:15 pm STEM Education Oral Presentations Session 3
    (Science Building 1003, 1006, 1190, 1191)
12:15 pm - 1:30 pm  Lunch – Science Building Atrium
1:30 pm - 3:00 pm  STEM Education Oral Presentations Session 4
    (Science Building 1003, 1006, 1190, 1191)
Oral Presentations

A Quantitative Ethnography of Computer Scientist Identity
......................................................................................................................Tim Ransom

A Research-Based Dual Enrollment Statistics Class at ETSU
..............................................................................................................Maria Emilia Alfaro, Tom Hicks, & Anant Godbole

Affordances of Self-Study Methodology for Understanding Researcher Positionality
.................................................................................................................................Samantha Fletcher

Assessing Elementary Preservice Teachers’ Knowledge for Fraction Division
.................................................................................................................................Kingsley Adamoah & Jeremy Strayer

Assessing the Programming Self-efficacy of Teachers through Professional Development Combining Drones and STEM Activities
.................................................................................................................................Deborah McAllister

Beyond Gender and Race: The Representation of Concealable Identities Among College Science Instructors
................................................................................................................................Carly Busch, Katelyn M. Cooper, & Sara E. Brownell

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

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

Enhancing STEM Learning Environments: Exploring Professional Development Opportunities in Workshops to Improve Students' Critical Thinking Skills
.................................................................................................................................Gideon Eduah, Andrea Arce-Trigatti, & Ada Haynes

Examining Relationships Between Secondary Teachers’ Content Knowledge and Attitudinal Traits
.................................................................................................................................Christopher Bonnesen, Andrew Ross, Jeremy Strayer, & Yvonne Lai

Examining the Relationship between Classroom Assessment and Project Based Learning
........................................................................................................................................Collin McDonald & Daniel Siao

IMAGES of STEM: Implications for Cohort Learning and Professional Development in Undergraduate STEM Education
.................................................................................................................................Wanda Payne & Martene Stanberry
Improving Undergraduate Success Through Effective Critical Thinking

Nathan Duran Ledezma, Joseph Biernacki, Twanelle Majors, Stephanie Wendt, & Indranil Bhattacharya

Locating Holes in the Leaky Pipeline: A Quantitative Investigation into Factors and Trends Within the STEM Attrition Crisis

Casandra Koevoets-Beach & Morgan Balabanoff

Meta-Analysis of Teaching Professional Development for STEM Graduate Teaching Assistants

Grant Gardner, Alyssa Freeman, Chelsea Rolle, & Kadence Riggs

Pairing Sustainability with Innovation: Measuring Student Performance in a Foundry-Guided Intervention

Dipendra Wagale, Andrea Arce-Trigatti, Pedro E. Arce, & J. Robby Sanders

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, Sara E. Brownell, & M. Elizabeth Barnes

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

STEM for All: TVI Perspectives

Lisa Salvato

STEM, Literacy and Computation in Education for School Leaders (SLICE-SL)

Chihche Tai

Strategic Planning Platform for Engaged Regional Research and Industry Development

K. Madeline Boykin, Gabriela Gurau, Robin Rogers, Jonathan Bonner, Jeff Gray, Chris, Crawford, Tasha Drake, & Brian Pillay

Student Perceptions of Individual and Group Creativity in Proving

Amanda Heath

Systematic Literature Review Characterizing Students’ Operational Atomic Structure Knowledge

Emmanuel Echeverri-Jimenez & Morgan Balabanoff

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
The Case-Based Active Science Education (CASE) Mentoring Network
Rebecca Seipelt-Thiemann, Nancy Maroushek Boury, Patrick Armstrong, Brock Couch, Jim Haynes, Olena James, Sayali Kukday, Zach Grimes, Audrey McCombs, & Nick Peters

The Impact of Religious Identity on The Efficacy of Evolution Instruction with Cultural Competence
Rahmi Aini, Alexa Summersill, Casey Epting, Baylee Edwards, Sara Brownell, & M. Elizabeth Barnes

The Influence of Cultural Perceptions in the Preference and Choice of STEM Programs
Priscilla Moffat

The Influence of Near-Peer Mentoring on Undergraduate Career Goal Development in a Community of Research Teams
Thomas Stiles

The Interplay of Housing Instability and Mathematics during Adolescence: A Retrospective Study of Black STEM Folx
Sharetta Bufford

The Relationship between Autonomy, Pedagogical Discontentment, Self-Efficacy and the Teaching Practices of Graduate Teaching Assistants
Alyssa Freeman, Chelsea Rolle, Kadence Riggs, & Tom Brinthaupt

Using Questions to Support Student Sensemaking in an Integrated STEM Investigation
Lori Klukowski & Fonya C. Scott

Who Wrote it Better? A Comparison of AI and Teacher Created Lessons for High School Mathematics
Emily McDonald
Poster Presentations

A Conversation with BlueBot: Promoting STEM Education via Chatbots
.........................................................................................................................Zain Al-Saad & Tisha Gaines

Analysis of Demographic and Experiential Interactions in Quantitative General Education
USAFA Courses and their Impact on STEM Attrition
.......................................................................................................................Wilson Gonzalez-Espada, Capt. Scott Alsid, Maj. Daniel O'Keefe,
Lt. Col. David Meier, & Maj Christopher M. Francis

Analysis of Performance on the Praxis Biology Content Knowledge Test at the Category-Level
......................................................................................................................Andrea Reeder & Heather Green

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 N. Hosbein

Computing Education in Ghana: A Preliminary Investigation
.......................................................................................................................Crystal Davis & Ryan Andrew Nivens

Examining Students' Epistemic Knowledge of Atomic Structure Models in Chemistry
....................................................................................................................Salawat Lateef, Emmanuel Echeverri Jimenez, & Morgan Balabanoff

Examining the Impact of Design-Based Research Methods on Project Implementation
....................................................................................................................Skylar Hubbarth, Anna Grace Hunter, Shannon Conner, & D. Matthew Boyer

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

Initial Impacts of a Community-Engaged Learning Focus on Pre-Service Teachers in an Early
STEM Collaboration
....................................................................................................................Amie Perry & Alissa Lange

Interdisciplinary Assessment of Student Thinking About Variability
.......................................................................................................................Fonya Scott, Rebecca Klukowski, Kaytlin Campbell, & Oscar Meza-Abarca

Investigating Factors Influencing Science Student Retention
.......................................................................................................................Hayley Benson & Morgan Balabanoff

Investigating Pre-Health Students’ Science Identity and the Factors that Influence them to
Change Programs or Tracks
....................................................................................................................Taylor Humphreys & Morgan Balabanoff

Investigating the Utility of and Barriers to Educational Resources for Students in STEM
.......................................................................................................................Claire Ward & Morgan Balabanoff
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

Lessons Learned: TTU STEM Majors for Rural Teaching (SMaRT) Noyce Scholarship Program

Holly Anthony & Stephen Robinson

Meaningful Mathematics with Coding - Teacher Training and Collaboration with Incorporating Computer Science Principles in High School Mathematics

Emily McDonald

Measuring Goal Alignment within a Community of Research Teams

Thomas Stiles

Metacognition in Assessing Evolutionary Understanding: A Consideration

Rahmi Aini & M. Elizabeth Barnes

Parent’s Early Home Math Support Does Not Correlate between Survey and Interview Responses

Brooke Poston, Camille Msall, Ashli-Ann Douglas, & Bethany Rittle-Johnson

Parental Mathematics Support Through Pattern Activities and Talk

Alexis Richmond, Camille Msall, Ashli-Ann Douglas, Faith Logan, & Bethany Rittle-Johnson

Partnership To Develop Fermentation Science as a Curricular Enhancement to Basic Undergraduate Stem Classes

Tony Johnston, Terry Goodin, & Ginger Rowell

Preparing Area Pipeline Students: Evaluation of a STEM Summer Engineering Bridge Program

Selvum B. Pillay, K. Madeline Boykin, Jeffrey W. Holmes, Haibin Ning, Krusha Patel, & Mubenga N. Nkashama

Psychometrics of a Researcher-made Worked Examples Assessment for Math Word Problem Solving

Vishakha Agrawal, Marcia A. Barnes, & Sarah Powell

The Impact of Two Sequential CURES on Student Outcomes in an Introductory Biology Laboratory Course

Emma Throneburg, Jeffery Masters, & Mikus Abolins-Abols

U.S. Mathematics Major Retention and Attrition: A Survey Study

Amanda Heath

Use of Smartphone Sensors to Enhance Lab Activities in an Introductory Physics Course

David Meier