



*Association of Mathematics Teacher Educators*



# **TWENTY-FOURTH ANNUAL AMTE CONFERENCE**

# **2020**

**FEBRUARY 6 - 8, 2020**

**PRELIMINARY PROGRAM**

Email feedback to [programchair@amte.net](mailto:programchair@amte.net)

**SHERATON PHOENIX DOWNTOWN HOTEL**

PHOENIX, ARIZONA

# CONFERENCE SCHEDULE

## 2020 ANNUAL AMTE CONFERENCE FEBRUARY 6-8, 2020, PHOENIX, ARIZONA

### WEDNESDAY, FEBRUARY 5, 2020

4:30 PM – 7:30 PM AMTE Registration Desk Open

### THURSDAY, FEBRUARY 6, 2020

7:00 AM – 5:00 PM AMTE Registration Desk Open  
10:00 AM – 5:00 PM Exhibits Open  
**8:15 AM – 10:15 AM Opening Session – Phoenix D/E**  
10:45 AM – 11:45 AM Concurrent Sessions  
11:45 AM – 1:15 PM Lunch – Phoenix C  
1:15 PM – 2:00 PM Concurrent Sessions  
2:15 PM – 3:00 PM Concurrent Sessions  
3:00 PM – 3:30 PM Break  
3:30 PM – 4:30 PM Concurrent Sessions  
4:45 PM – 5:30 PM Concurrent Sessions  
5:30 PM – 6:30 PM Reception for Graduate Students & Early Career Faculty – Valley Overlook (Fourth Level)

### FRIDAY, FEBRUARY 7, 2020

6:45 AM – 7:45 AM Breakfast – Phoenix C  
6:45 AM – 7:45 AM Advocacy and Emerging Issues Breakfast – Phoenix D  
7:30 AM – 4:30 PM AMTE Registration Desk Open  
8:30 AM – 5:00 PM Exhibits Open  
8:00 AM – 9:00 AM Concurrent Sessions  
9:15 AM – 10:00 AM Concurrent Sessions  
10:15 AM – 11:30 AM Concurrent Sessions  
11:30 AM – 1:00 PM Lunch – Phoenix C  
1:00 PM – 2:00 PM Poster Session – Phoenix D  
2:15 PM – 3:00 PM Concurrent Sessions  
3:00 PM – 3:30 PM Break  
3:30 PM – 4:30 PM Concurrent Sessions  
**5:00 PM – 6:30 PM Judith E. Jacobs Lecture – Phoenix C**  
6:30 PM – 7:30 PM Reception for All Conference Attendees – 3<sup>rd</sup> Street Foyer

### SATURDAY, FEBRUARY 8, 2020

6:45 AM – 7:45 AM Breakfast and Affiliate Meetings – Phoenix C  
7:30 AM – 10:30 AM AMTE Registration Desk Open  
8:00 AM – 9:00 AM Concurrent Sessions  
9:15 AM – 10:15 AM Concurrent Sessions  
10:30 AM – 11:30 AM Concurrent Sessions  
**11:30 AM – 1:15 PM Lunch and Business Meeting – Phoenix C**

# CONFERENCE INFORMATION

## CONFERENCE REGISTRATION DESK

Please stop by the AMTE Registration Desk, located in the Phoenix Ballroom Foyer on the Third Level, to obtain your conference materials, including your nametag and the conference program, if you requested a print copy.

## AMTE REGISTRATION DESK HOURS

<b>WEDNESDAY</b>	<b>4:30 PM - 7:30 PM</b>
<b>THURSDAY</b>	<b>7:00 AM - 5:00 PM</b>
<b>FRIDAY</b>	<b>7:30 AM - 4:30 PM</b>
<b>SATURDAY</b>	<b>7:30 AM - 10:30 AM</b>

## FINDING THE CONFERENCE AREA

Conference session rooms are located on the Second and Third Levels. Meals will be held in Phoenix C Ballroom on the Third Level. For your convenience, a map of the hotel conference area is printed on the back of the program book. For other questions about hotel facilities, please contact the volunteers at the AMTE Registration Desk or the hotel staff.

## WIRELESS INTERNET ACCESS

Complimentary wireless internet access in the conference/meeting area of the hotel for conference attendees is provided for AMTE usage throughout the conference. Using your laptop or mobile device, look for the network or SSID – **Sheraton\_CONFERENCE** and use the Password (not case-sensitive): **AMTE2020**

Conference attendees who are staying at the Sheraton Phoenix Downtown Hotel receive complimentary internet access in individual guestrooms for the duration of the conference. Directions on how to access wireless and wired internet service can be found in each guestroom.

## CANCELLATIONS AND PROGRAM CHANGES

For updated lists of cancellations and other program changes, visit [amte.net/conferences/conf2020/updates](http://amte.net/conferences/conf2020/updates).

## HOTEL PARKING INFORMATION

Self-parking at the Sheraton Phoenix Downtown Hotel is available at the discounted rate of \$10 per day for everyone attending the conference. This rate will be noted on the room key for attendees staying at the Sheraton Phoenix Downtown Hotel. Valet parking is also available for \$37 per car per day (price subject to change).

## OPTIONS FOR DINNER

The Sheraton Phoenix Downtown Hotel has a restaurant in the Paradise Valley room on the second level serving breakfast, lunch, dinner, and cocktail options each day. Several dining options are available within walking distance of the hotel. For information on nearby restaurants, inquire with the Hotel Concierge, Conference App, or AMTE Registration Desk.

## CONFERENCE PHOTOGRAPHS

Photographs are being taken during the conference for use on the AMTE website, newsletters, and brochures. These photographs will not be sold or distributed in any way beyond the promotion of AMTE and its conference. If you do not wish your likeness to be used in these ways, please contact AMTE Executive Director, Tim Hendrix, at the conference or via email at [hendrixt@meredith.edu](mailto:hendrixt@meredith.edu). Thanks to Tyler Mahal for serving as conference photographer.

## PERSONAL PROPERTY

Please note that the hotel is not responsible for the safekeeping of equipment such as laptop computers or personal LCD projectors, supplies, written materials, or any other items that are unattended or left in meeting rooms by conference attendees.

## LOST AND FOUND

Please drop off any unclaimed found items at the AMTE Registration Desk. Or you can drop off items at the Manager-On-Duty desk located at the hotel front desk next to the bell stand. AMTE and the hotel are not responsible for items being left in the session rooms and in the conference area.

## EXHIBITS

**THURSDAY**

**10:00 AM – 5:00 PM**

**FRIDAY**

**8:30 AM – 5:00 PM**

Make sure to visit the exhibits located in the Phoenix Ballroom Foyer! Exhibitors include Casio America, Inc. - ClassPad, CPM Educational Program, Great Minds - Eureka Math, Information Age Publishing - IAP, Math Learning Center, NCSM - Leadership in Mathematics Education, National Council of Teachers of Mathematics, and TODOS - Education for ALL! See the Exhibitors Section of this program for more information.

## COMMITTEE MEETINGS

AMTE Committees will meet during the conference according to the schedule provided to committee leaders. These meetings will take place in either Arcadia Boardroom (Second Level) or Coronado Boardroom (Third Level).

## AFFILIATE MEETINGS

AMTE Affiliates will meet during breakfast on Saturday in Phoenix C. This is a great time to meet each other face-to-face and discuss a game plan for the upcoming year. See page 9 in your conference program for table locations for each affiliate.

## COLLABORATION SPACE

**THURSDAY**

**8:00 AM – 6:30 PM**

**FRIDAY**

**8:00 AM – 4:30 PM**

**SATURDAY**

**8:00 AM – 11:30 PM**

A space for collaboration and informal meetings among conference attendees will be available in the 3<sup>rd</sup> Street Foyer (Third Level). Please take advantage of this area to share your conference experiences and engage in productive discussions with other conference attendees.

# CONFERENCE APP & SOCIAL MEDIA

## USE THE FREE AMTE CONFERENCE APP TO:

- View the Conference Program
- Organize your schedule
- Find more information about speakers and attendees
- Join informal Meet-Ups
- Share documents, participate in audience surveys, polls, and Q & A sessions
- Engage attendees and colleagues around the world through Social Media



The official app is available through the major app stores. Search "AMTE 2020", or go to:

**AMTE2020.QUICKMOBILE.MOBI**

Username = **(your registration email address before the @ symbol)**

Password = **amte20**



Web Application

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**FOLLOW AMTE ON TWITTER**



[@AMTEnews](https://twitter.com/AMTEnews)



Apple App Store



Google Play App Store

**USE #AMTE2020 TO JOIN PUBLIC DISCUSSION AROUND THE CONFERENCE.**



**COFFEE AND TEA**

Please join us in greeting first-time and returning attendees over coffee and tea in the lobby outside Phoenix C.

(There are options for breakfast in the hotel at the Sheraton Link Café in the lobby area, in the Paradise Valley room on the second level, and at nearby restaurants.)

**PHOENIX BALLROOM FOYER**



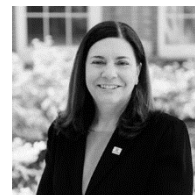
**OPENING SESSION**

**LOOKING DOWN THE AMTE ROAD**

Kathryn Chval, University of Missouri  
 Carlos Nicolas Gomez, Clemson University  
 Mike Steele, University of Wisconsin, Milwaukee

Mathematics Teacher Education is undergoing major disruptions. Nationally, mathematics teacher shortages are prominent while enrollment in university-based teacher education programs continue to decline. We are more aware of the inequities that affect who learns mathematics and who teaches mathematics. Technologies continue to provide new opportunities to change the ways teachers are educated and engaged in professional development. Our current context suggests that AMTE should play a critical role as we face challenges and opportunities associated with these disruptions. A panel will challenge us during the opening session of the 2020 AMTE Conference as they discuss the future of mathematics teacher education in general and AMTE's role in particular. As a community, we will consider the role AMTE might play so that its impact is significant ten or more years into the future, including policies and practices we ought to embrace, the partnerships we need to form, and the people who ought to be part of our organization. The panelists will also highlight initiatives that have been successful and show promise for the future as we work together to address challenges we will ultimately face.

**PHOENIX D/E**



## OVERVIEW OF THURSDAY MORNING, FEBRUARY 6, 2020

	10:45 AM – 11:45 AM
<b>Desert Sky</b>	1. <i>Brief Report Session: Teaching Mathematical Modeling-</i> Luebeck; Asempapa & Alhammouri; Ozturk, Sanjari, & Manouchehri
<b>Cave Creek</b>	2. <i>Simulations in the Elementary Methods Class: Supporting Preservice Teachers in Leading Mathematical Discussions-</i> Liebars & Howell
<b>Ahwatukee A</b>	3. <i>Brief Report Session: Prospective Teachers' Experiences, Stories, and Identities-</i> Davis; Ward; Neihaus
<b>Ahwatukee B</b>	4. <i>Using Student Thinking in Instruction: Leveraging Student Thinking or Endorsing a Particular Method?-</i> Hawthorne & Gruver
<b>Laveen A</b>	5. <i>Designing Teacher Assessments to Improve Feedback for Mathematics Teacher Education-</i> Jacobson, Walkowiak, & Bradshaw
<b>Laveen B</b>	6. <i>Brief Report Session: Fractions-</i> Marmur & Zazkis; Lee
<b>South Mountain</b>	7. <i>Tools to Support Teaching Mathematics Content and Pedagogy Online-</i> Swartz
<b>Estrella</b>	8. <i>Mathematical Tasks as Focus of a Professional Development for Middle School Teachers-</i> Ozgun-Koca, Lewis, & Ferry
<b>Maryvale A</b>	9. <i>Supporting African American Male Mathematics Students: MTEs' High-Impact Practices-</i> Jett AMTE Early Career Award Winner
<b>Maryvale B</b>	10. <i>Does Place Matter? Implementing a Spatial Justice Framework-</i> Poling & Weiland
<b>Encanto A</b>	11. <i>Facilitating Middle and Secondary Mathematics Teachers' Learning of Statistical Design-</i> Peters
<b>Encanto B</b>	12. <i>Whose "Support Group"?: Negotiating Purpose within Partnership between Mathematics Teacher Researchers and Teacher Educator Researchers-</i> Scroggins, Jackson, & Herbel Eisenmann
<b>Phoenix A</b>	13. <i>Implementing Lessons to Teach Prospective Teachers to Notice High Leverage Practices-</i> Gallagher & Rougee
<b>Phoenix B</b>	14. <i>Teachers' Beliefs About How to Support Students in Making Future Use of their Mathematics Learning-</i> Diamond
<b>Phoenix D</b>	15. <i>A Collaborative Inquiry Model for Teacher Professional Development: A Focus on Formative Assessment and Student Agency-</i> Pitvorec & Castro Superfine
<b>Phoenix E</b>	16. <i>Research-Based, Targeted Interventions to Support and Retain Early Career Secondary Mathematics Teachers-</i> Amick

**Session 1**

Desert Sky

**BRIEF REPORT SESSION: TEACHING MATHEMATICAL MODELING****CHANGING TEACHERS' (MIS)CONCEPTIONS ABOUT MATHEMATICAL MODELING: OUTCOMES FROM THE MONTANA MODELING INITIATIVE**

Jennifer Luebeck, Montana State University

Montana's Modeling Initiative offers teachers a framework to deepen their conceptual understanding of modeling, explore and assess modeling tasks, and design original tasks for Algebra and Geometry. Session reviews the framework, showcases sample tasks, and presents results of task analysis.

**DEVELOPING PRESERVICE TEACHERS' CAPACITY TO CREATE MATHEMATICAL MODELING TASKS**Reuben Asempapa, Pennsylvania State University, Harrisburg  
Ahmad Alhammouri, Jacksonville State University

This session addresses the challenges in engaging students with modeling. We discuss a framework on how to create tasks that will effectively engage students in modeling practices. The goal is to support and enhance PSTs' knowledge and pedagogical practices in modeling.

**PEDAGOGY OF TECHNOLOGY INTEGRATED MATHEMATICAL MODELING INSTRUCTION**Ayse Ozturk, The Ohio State University  
Azin Sanjari, Arkansas Tech University  
Azita Manouchehri, The Ohio State University

This study focuses on examining a teacher's use of simulation as a pedagogical tool for developing students' modeling skills in identifying and coordinating variables while at the same time reinforcing algebraic reasoning.

**Session 2**

Cave Creek

*Practice-Based Experiences for Prospective Teachers*  
*Individual Session***SIMULATIONS IN THE ELEMENTARY METHODS CLASS: SUPPORTING PRESERVICE TEACHERS IN LEADING MATHEMATICAL DISCUSSIONS**Cathy S. Liebars, The College of New Jersey  
Heather Howell, Educational Testing Service

The presenters will share reflections and some surprising results on the on recent implementation of technology supported simulated classroom teaching as part of an elementary mathematics methods course. Participants will discuss course activities designed to support individual and group reflection.

**Session 3**

Ahwatukee A

**BRIEF REPORT SESSION: PROSPECTIVE TEACHERS' EXPERIENCES, STORIES, AND IDENTITIES****EXPLORING THE MATHEMATICS IDENTITIES OF PRESERVICE EARLY CHILDHOOD TEACHERS OF COLOR**

Ashley Renaire Davis, The Graduate Center, CUNY

This exploratory study sought to examine the construct of mathematics identity by examining the ways in which preservice early childhood teachers' identities as teachers of mathematics are linked to their experiences as learners.

**THE ROAD YOU TRAVELED: REEXAMINING PSTS EXPERIENCES TO TALK ABOUT THE SOCIOPOLITICAL NATURE OF MATH**

Jennifer Ward, Kennesaw State University

In mathematics methods engaging PSTs in considering their own histories in mathematics is critical (Marshall & Chao, 2016). These dialogues serve as opportunity to introduce dimensions of equity and the sociopolitical nature of mathematics teaching and learning (Gutiérrez, 2009, 2012).

**WHAT CAN WE LEARN FROM PROSPECTIVE TEACHERS' STORIES ABOUT EQUITY?**

Aubrey Neihaus, The University of Arizona

This work is on PSTs' stories of learning about equity. The stories' narrative features tell much regarding resources PSTs bring, ways in which they negotiate their learning about equity, and how they incorporate equity into their identity as future teachers

**Session 4**

Ahwatukee B

*Mathematics Pedagogy*  
*Individual Session***USING STUDENT THINKING IN INSTRUCTION: LEVERAGING STUDENT THINKING OR ENDORSING A PARTICULAR METHOD?**Casey W. Hawthorne, Furman University  
John Gruver, Michigan Technological University

This study characterizes a way of orchestrating class discussion we refer to as endorsing, in which the teacher privileges a particular way of reasoning. While this shares surface-level features with productively leveraging student thinking, we illustrate problematic features of endorsing.

**Session 5** **Laveen A**  
*Mathematics Content and Curriculum*  
*Individual Session*

## **DESIGNING TEACHER ASSESSMENTS TO IMPROVE FEEDBACK FOR MATHEMATICS TEACHER EDUCATION**

Erik Jacobson, Indiana University  
Temple A. Walkowiak, North Carolina State University  
Laine Bradshaw, University of Georgia

We present a strategy for mathematics teacher assessment with potential to directly inform the continuous improvement of workshops, classes, and preparation programs. Items that assess specific mathematical topics and teaching practices are individually linked to evidence of classroom impact.

**Session 6** **Laveen B**

## **BRIEF REPORT SESSION: FRACTIONS**

### **ATYPICAL REPRESENTATIONS OF FRACTIONS: PROSPECTIVE TEACHERS EXPLAIN**

Ofer Marmur, Simon Fraser University  
Rina Zazkis, Simon Fraser University

We explore prospective teachers' attempts to explain atypical fraction representations, particularly when non-integers appear in the numerator or denominator. As practical implication, we advocate the use of the set model to interpret atypical representations and expand learners' understanding of fractions.

### **PUTTING A SPOTLIGHT ON AREA MODELS: PRESERVICE TEACHERS' CAPACITY TO LINK FRACTIONS AND GEOMETRIC MEASUREMENT**

Mi Yeon Lee, Arizona State University

To explore preservice teachers' (PSTs') understanding of area models in fractions, a non-typical task was given to 82 PSTs. The strategies used by those who solved the problem correctly and the misconceptions of those who did not are discussed.

**Session 7** **South Mountain**  
*Teaching and Learning with Technology*  
*Individual Session*

## **TOOLS TO SUPPORT TEACHING MATHEMATICS CONTENT AND PEDAGOGY ONLINE**

Barbara Ann Swartz, McDaniel College

This session will explore course designs and digital tools to promote the achievement of AMTE's (2017) Standards for Preparing Teachers of Mathematics in the online environment for mathematics and mathematics education courses.

**Session 8** **Estrella**  
*Professional Development*  
*Individual Session*

## **MATHEMATICAL TASKS AS FOCUS OF A PROFESSIONAL DEVELOPMENT FOR MIDDLE SCHOOL TEACHERS**

S. Asli Ozgun-Koca, Wayne State University  
Jennifer M. Lewis, Wayne State University  
Deborah Ferry, Macomb Independent School District

Mathematical tasks are a useful window onto teachers' thinking about instruction because tasks are instantiations of the mathematics curriculum. After sharing our conceptual framework, we will unpack the different ways of using mathematical tasks in a PD with evidence.

**Session 9** **Maryvale A**  
*AMTE Early Career Award Winner*

## **SUPPORTING AFRICAN AMERICAN MALE MATHEMATICS STUDENTS: MTES' HIGH-IMPACT PRACTICES**

Christopher C. Jett, University of West Georgia

In this session, MTEs will be exposed to scholarship regarding African American male students' experiences. Then, they will critically examine relevant cases. Finally, MTEs will share evidence-based practices to positively influence the mathematics achievement outcomes for African American male students.

**Session 10** **Maryvale B**  
*Equity, Social Justice, and Mathematics Teacher Education*  
*Individual Session*

## **DOES PLACE MATTER? IMPLEMENTING A SPATIAL JUSTICE FRAMEWORK**

Lisa Poling, Appalachian State University  
Travis Weiland, Appalachian State University

Our work differs from past work related to spatial justice research in that we seek to consider four aspects, socio-cultural, critical, quantitative, and spatial, as interwoven and inseparable in guiding the creation of quantitative learning experiences for preservice teachers.

**Session 11** **Encanto A**  
*Professional Development*  
*Individual Session*

## **FACILITATING MIDDLE AND SECONDARY MATHEMATICS TEACHERS' LEARNING OF STATISTICAL DESIGN**

Susan A. Peters, University of Louisville

Participants engage with concept-building activities that promote teaching and learning of statistical design and are consistent with professional recommendations for statistics teacher education (AMTE, SET). Discussion focuses on features of the activities that are effective for developing teachers' statistical understandings.

**Session 12** **Encanto B**  
*Collaborations and Partnerships*  
*Individual Session*

## **WHOSE "SUPPORT GROUP"?: NEGOTIATING PURPOSE WITHIN PARTNERSHIP BETWEEN MATHEMATICS TEACHER RESEARCHERS AND TEACHER EDUCATOR RESEARCHERS**

Ashley Danielle Scroggins, University of Colorado, Boulder  
Brent Jackson, Michigan State University  
Beth Herbel Eisenmann, Michigan State University

In school-university partnerships without students, the ambitions of allywork with mathematics students and teacher researchers can produce tension. This session will interrogate the discursive practices used in negotiating partnership purpose during a community discussion in an equitable mathematics professional development.



**Session 13**

*Mathematics Pedagogy  
Discussion Session*

**Phoenix A****IMPLEMENTING LESSONS TO TEACH PROSPECTIVE TEACHERS TO NOTICE HIGH LEVERAGE PRACTICES**

Melissa A. Gallagher, University of Louisiana, Lafayette  
Annick Rougee, Washington State University, TriCities

This discussion presentation will share the four lessons that were created to support PTs' professional noticing of HLPs selected from the Mathematical Quality of Instruction (MQI; Hill et al., 2008) and develop opportunities for collaboration among participants.

**Session 14**

*Mathematics Content and Curriculum  
Individual Session*

**Phoenix B****TEACHERS' BELIEFS ABOUT HOW TO SUPPORT STUDENTS IN MAKING FUTURE USE OF THEIR MATHEMATICS LEARNING**

Jaime Diamond, University of Georgia

I share results from a study examining teachers' beliefs about how to support students in making future use of their mathematics learning and facilitate discussion connecting these results with educational documents that call for and outline good mathematics teaching.

**Session 15**

*Professional Development  
Individual Session*

**Phoenix D****A COLLABORATIVE INQUIRY MODEL FOR TEACHER PROFESSIONAL DEVELOPMENT: A FOCUS ON FORMATIVE ASSESSMENT AND STUDENT AGENCY**

Kathleen Pitvorec, University of Illinois, Chicago  
Alison Castro Superfine, University of Illinois, Chicago

In this session, we engage participants in exploring our model of engaging with teachers in collaborative-inquiry where teacher-researcher dyads collaborate to examine teachers' videotaped lessons to identify where and how teachers might increase student agency, thereby enhancing formative assessment opportunities.

**Session 16**

*Collaborations and Partnerships  
Individual Session*

**Phoenix E****RESEARCH-BASED, TARGETED INTERVENTIONS TO SUPPORT AND RETAIN EARLY CAREER SECONDARY MATHEMATICS TEACHERS**

Lisa Amick, University of Kentucky

This session reports on the design and initial implementation of two year-long (AY 2018-2019) pilot interventions, created through a design-based approach, intended to support secondary mathematics teachers in their first year of teaching.

**THURSDAY, FEBRUARY 6, 2020****11:45 AM - 1:15 PM****LUNCH**

AMTE provides a buffet lunch in Phoenix C. Please join your colleagues for lunch and good conversation before the Thursday afternoon sessions.

**PHOENIX C**

## OVERVIEW OF THURSDAY AFTERNOON, FEBRUARY 6, 2020

	<b>1:15 PM - 2:00 PM</b>	<b>2:15 PM - 3:00 PM</b>
<b>Desert Sky</b>	17. <i>What if...?: Exploring Thought Experiments and the Development of Adaptive Expertise in Rehearsal Debriefs-</i> Munson & Baldinger	33. <i>Developing Preservice and Inservice Teachers Ability to Teach Proof in High School Geometry-</i> Nirode & Boyd
<b>Cave Creek</b>	18. <i>The Power of Rehearsal: Developing Mathematics Teacher Candidates' Teaching, Learning, and Assessing Habits and Practices-</i> Sugimoto & Rigelman	34. <i>Reflecting on Scaling Professional Development, a Decade in: Findings, Methodology, and Persistent Questions-</i> Kaschner, Neihaus, & McGraw
<b>Ahwatukee A</b>	19. <i>What's the Lesson?: Following a Lesson Study Through Professional Contexts-</i> Erickson & Makowski	35. <i>Contrasting Sociomathematical Norms in Lessons with/out Interactive Simulations-</i> Atabas
<b>Ahwatukee B</b>	20. <i>State Involvement in Elementary Mathematics Digital Curricula-</i> Rhine & Driskell	36. <i>Seeing the Forest Through the Trees: MTEs Making Sense of Multiple Perspectives on Equity-</i> Stoehr, Lopez Leiva, Fernandes, & Edwards
<b>Laveen A</b>	21. <i>Understanding District Teacher Leaders' Visions of High Quality Middle School Mathematics Instruction-</i> Stephan	37. <i>I Used to Think, Now I Know - Using Reflective Writing to Make Thinking Visible-</i> Gay & Lucas
<b>Laveen B</b>	22. <i>Actions &amp; Accountability towards Social Justice in Mathematics Education de TODOS-</i> Lopez Leiva, de Araujo, & Zavala	38. <i>Create Equity for Students through Intentional Teacher Collaboration-</i> Toncheff
<b>South Mountain</b>	29. <i>Defining Core Practices for Mathematical Modeling for Elementary Mathematics Teachers-</i> Suh, Turner, Roth McDuffie, Aguirre, & Birkhead	
<b>Estrella</b>	30. <i>Identifying Initial Recommendations for Infusing Mathematical Writing within Teacher Preparation Programs-</i> Colonnese & Casa	
<b>Maryvale A</b>	23. <i>Opportunities, Advocacy, and Communication in Support of MTE: Standards, HEA, Infographics, and Case Studies-</i> Berry, Wilkerson, Martin, & Barnes	39. <i>Supporting the Enactment of Ambitious Practices through an Online Community-</i> Ebby, Goldsmith-Markey, & Remillard
<b>Maryvale B</b>	31. <i>But I'm not creative enough! Supporting Novice Teachers: Culturally Relevant Pedagogy and Social Justice Math-</i> Cook & Yanisko	
<b>Encanto A</b>	24. <i>Professional Development that is Inclusive of and Responsive to Teachers' Voices-</i> Liu, Galindo, Bharaj, & Yoder	40. <i>Threading Project-Based Learning (PBL) in Teacher Preparation Clinical Residency Program-</i> Lee & Sachs
<b>Encanto B</b>	32. <i>Considering Quantitative, Sociocultural, Spatial, and Critical Ways of Knowing in Preservice Teacher Education-</i> Weiland & Poling	
<b>Phoenix A</b>	25. <i>MTE Questioning in Methods Courses: How and What do We Come to Know?-</i> Lischka, Kastberg, & Hillman	41. <i>The Principles and Practices of Teaching and Learning Math Outside-</i> Baker
<b>Phoenix B</b>	26. <i>Mathematics teacher educator knowledge: What is it, and how do we support its development?-</i> Olanoff, Prasad, & Welder	42. <i>Are We Providing High-Quality Mathematics Instruction for All?: Highlights from the 2018 NSSME+-</i> Malzahn
<b>Phoenix D</b>	27. <i>Brief Report Session: Practice-based Pedagogies-</i> Madis, Ruk, Van Zoest, Peterson, & Stockero; Brasel & Gonzalez	43. <i>Brief Report Session: Partnering with Communities-</i> Bonner, Kalinec-Craig, & Hinojosa; Kelley
<b>Phoenix E</b>	28. <i>Brief Report Session: Innovation in Recruitment and Retention of Teachers-</i> Brantlinger & Cooley; Harris, Kurz, Ganesh, & Dyer	44. <i>Brief Report Session: Focusing on Students-</i> Gomez, Jones, & Tanck; Kurtz

	<b>3:30 PM - 4:30 PM</b>	<b>4:45 PM - 5:30 PM</b>
<b>Desert Sky</b>	45. <i>Brief Report Session: Teaching Geometry with Technology-</i> Zambak; An; Yao	61. <i>Geometric Transformations &amp; Desmos: Reflections from a Study on Curricular Reasoning-</i> Olson & Dingman
<b>Cave Creek</b>	46. <i>Centering Building Relationships with Children in Field-Based Elementary Math Methods-</i> Turrou, Johnson, McMillan, & Franke	62. <i>Creative Mathematical Reasoning and Key Curricular Content as an Evaluative Framework for Preservice Task Engagement-</i> Martin, Cullen, & Day
<b>Ahwatukee A</b>	47. <i>Brief Report Session: Preservice Teachers' Knowledge-</i> Lloyd & Rice; Reeder, Utley, & Che; Kirwan & Barker	63. <i>The Viability and Impact of Building District Mathematical Professional Development Capacity-</i> Novak
<b>Ahwatukee B</b>	48. <i>Fluency Development in Content Courses for Elementary Teachers-</i> Walters	64. <i>Many Perspectives, One Vision: Learning to Respond to Student Thinking by Reflecting on Shared Experience-</i> Patterson & Warshauer
<b>Laveen A</b>	49. <i>Embedded Days for Professional Development: Structure, Activities, and Results-</i> Jones & Lamb	65. <i>Brief Report Session: Eliciting Student Thinking-</i> Reinke; Jensen & Gallagher
<b>Laveen B</b>	50. <i>Brief Report Session: Probability and Statistics-</i> Hertel; Cannon	66. <i>Brief Report Session: Secondary Teachers' Views of Teacher Preparation-</i> White; Allen
<b>South Mountain</b>	58. <i>Connecting Preservice Teachers' Learning of Mathematics and Pedagogy to Social Justice and Culturally Responsive Teaching-</i> McGraw	
<b>Estrella</b>	51. <i>Supporting Mathematics Teachers' Understanding of Privilege and Oppression: A Critical Examination-</i> Bartell, Koestler, & Amidon	67. <i>Brief Report Session: Equity and Preservice Teachers-</i> Przybyla-Kuchek; Sears, Dupree, & Castro-Minnehan
<b>Maryvale A</b>	52. <i>Preparing to Launch a Task: What Does it Look Like for Pre-Service Teachers?-</i> Snider, Creager, & Parrish	68. <i>Using mathematical noticing in deepening mathematical understanding for teaching the concept of function-</i> Heid
<b>Maryvale B</b>	53. <i>Geometric Transformations: Alignment of Teachers Mathematical Goals to Research-Based Learning Trajectories-</i> Nielsen, Teuscher, & Cloward	69. <i>A Measurement Lesson Leveraging Quantitative Reasoning for Elementary Prospective Teachers-</i> Lee
<b>Encanto A</b>	54. <i>Leveraging Dynamic Geometry Software to Promote Authentic Mathematics-</i> Boyd & Nirode	70. <i>Addressing Mathematics Anxiety in Preservice Teachers Through Creating Explicit Awareness in the Classroom-</i> Hansen
<b>Encanto B</b>	55. <i>Rethinking the Student Teaching Experience: Engaging in a Dialogue about Paired-Placement Student Teaching-</i> Edenfield & Christensen	71. <i>Using Robotics to Emphasize the M in STEM-</i> Thomas, Buchheister, & Sokoll
<b>Phoenix A</b>	59. <i>Humanizing Approaches to Grading with Mathematics Pre-Service Teachers: Navigating and Pushing Beyond Systems-</i> Raygoza, Lischka, Tanner, Males, Stone, Harper, & Sullivan	
<b>Phoenix B</b>	60. <i>A Critical Perspective on Equity Pedagogies and Race in Mathematics Education-</i> Louie, Zavala, Dunleavy, Kalinec-Craig, & Bannister	
<b>Phoenix D</b>	56. <i>Developing Coaching Skills for Rehearsals-</i> Miller & Jensen	72. <i>Practice-based Professional Development: Dilemmas in Balancing Pedagogies of Enactment and Pedagogies of Investigation-</i> Shaughnessy, Garcia, Mortimer, & Ball
<b>Phoenix E</b>	57. <i>An Intersectional Analysis of Justice-oriented Mathematics Teaching-</i> Garner	73. <i>Preservice Teachers' Understandings of the Professional Obligations of Mathematics Teaching-</i> Ortiz & Bieda

**Session 17** Desert Sky  
*Professional Development*  
*Individual Session*

### WHAT IF...?: EXPLORING THOUGHT EXPERIMENTS AND THE DEVELOPMENT OF ADAPTIVE EXPERTISE IN REHEARSAL DEBRIEFS

Jen Munson, Northwestern University  
 Erin E. Baldinger, University of Minnesota

Debrief discussions offer a window into how non-rehearsing teachers make meaning of rehearsals. In this session, we will discuss “thought experiments” shared by non-rehearsing teachers through the lens of how they may contribute to the development of adaptive expertise.

**Session 18** Cave Creek  
*Practice-Based Experiences for Prospective Teachers*  
*Individual Session*

### THE POWER OF REHEARSAL: DEVELOPING MATHEMATICS TEACHER CANDIDATES’ TEACHING, LEARNING, AND ASSESSING HABITS AND PRACTICES

Amanda T. Sugimoto, Portland State University  
 Nicole Rigelman, Portland State University

We will examine a series of field-based assignments—rehearsing aspects of the plan-instruct-assess cycle—and ways these experiences influenced teacher candidate learning. We will explore affordances and challenges, as well as ways to forefront equitable practices within any field-based work.

**Session 19** Ahwatukee A  
*Mathematics Pedagogy*  
*Individual Session*

### WHAT’S THE LESSON?: FOLLOWING A LESSON STUDY THROUGH PROFESSIONAL CONTEXTS

Ander Erickson, University of Washington, Tacoma  
 Martha Makowski, The University of Alabama

This presentation describes two cycles of a lesson study. The lesson facilitators worked to adapt the lesson on rational functions for different professional contexts between cycles. The session reviews the lesson, how thinking changed between contexts, and participants’ mathematical thinking.

**Session 20** Ahwatukee B  
*Mathematics Content and Curriculum*  
*Individual Session*

### STATE INVOLVEMENT IN ELEMENTARY MATHEMATICS DIGITAL CURRICULA

Steve Rhine, Pacific University  
 Shannon Driskell, University of Dayton

We present results from our survey to state math directors (37 states responded) regarding their role in guiding digital curricula (DC) acquisition decisions, professional development for teachers, and assessment of the impact of DC on students and teachers.

**Session 21** Laveen A  
*Collaborations and Partnerships*  
*Individual Session*

### UNDERSTANDING DISTRICT TEACHER LEADERS’ VISIONS OF HIGH QUALITY MIDDLE SCHOOL MATHEMATICS INSTRUCTION

Michelle Stephan, University of North Carolina, Charlotte

Twenty district teacher-leaders were convened to create instructional resources for teachers within the state that support new state standards. We explore how their resources revealed beliefs that both support and conflict with visions of high quality math instruction.

**Session 22** Laveen B  
*Individual Session*

### ACTIONS & ACCOUNTABILITY TOWARDS SOCIAL JUSTICE IN MATHEMATICS EDUCATION DE TODOS

Carlos A. LopezLeiva, University of New Mexico  
 Zandra de Araujo, University of Missouri  
 Maria del Rosario Zavala, San Francisco State University

Under the light of the TODOS and NCSM position statement for social justice in mathematics education, this session will present related actions that the TODOS organization has followed up on these issues and will identify future directions. The audience will be asked to actively engage in and contribute to the discussion during the presentation.

**Session 23** Maryvale A  
*Individual Session*

### OPPORTUNITIES, ADVOCACY, AND COMMUNICATION IN SUPPORT OF MTE: STANDARDS, HEA, INFOGRAPHICS, AND CASE STUDIES

Robert Berry, National Council of Teachers of Mathematics & University of Virginia  
 Trena Wilkerson, National Council of Teachers of Mathematics & Baylor University

W. Gary Martin, Auburn University  
 David Barnes, National Council of Teachers of Mathematics  
 Education in general, teacher education in particular, and mathematics teacher education specifically have at times been under attack in media, policy and legislative arenas. Learn about opportunities, successes, and strategies for advocating for positive change through your work.

**Session 24** Encanto A  
*Collaborations and Partnerships*  
*Individual Session*

### PROFESSIONAL DEVELOPMENT THAT IS INCLUSIVE OF AND RESPONSIVE TO TEACHERS’ VOICES

Jinqing Liu, Indiana University, Bloomington  
 Enrique Galindo, Indiana University  
 Pavneet Kaur Bharaj, Indiana University, Bloomington  
 Gina Borgioli Yoder, Indiana University - Purdue University Indianapolis

In this session, we will share a Collaborative Responsive Professional Development Model (CRPDM), where teachers became active professional developers having a say about both the professional growth they wanted and the means to attain their goals.

**Session 25**

Phoenix A

*Mathematics Pedagogy  
Discussion Session***MTE QUESTIONING IN METHODS COURSES: HOW AND WHAT DO WE COME TO KNOW?**

Alyson E. Lischka, Middle Tennessee State University  
Signe Kastberg, Purdue University  
Susan L. Hillman, Saginaw Valley State University

Participants will engage in reflective discussion of MTEs' questioning practices with mathematics focused questions and pedagogically focused questions in the context of teaching mathematics methods courses. Revising questions to support relational practice within mathematics teacher education will be explored.

**Session 26**

Phoenix B

*Development of Mathematics Teacher Educators  
Individual Session***MATHEMATICS TEACHER EDUCATOR KNOWLEDGE: WHAT IS IT, AND HOW DO WE SUPPORT ITS DEVELOPMENT?**

Dana Olanoff, Widener University  
Priya Vinata Prasad, The University of Texas, San Antonio  
Rachael M. Welder, Texas A&M University

In this session, we will present the results of our review of current research on teacher educator knowledge, and discuss the implications of the research review for designing professional learning opportunities for teacher educators.

**Session 27**

Phoenix D

**BRIEF REPORT SESSION: PRACTICE-BASED PEDAGOGIES****LEARNING A TEACHING PRACTICE THROUGH REPRESENTATIONS, DECOMPOSITIONS, AND APPROXIMATIONS**

Carlee Elizabeth Madis, Western Michigan University  
Joshua Michael Ruk, Western Michigan University  
Laura Van Zoest, Western Michigan University  
Blake E. Peterson, Brigham Young University  
Shari L. Stockero, Michigan Technological University

Preparing teachers to enact challenging teaching practices can be a difficult endeavor, even with experienced teachers. This presentation will show how representations, decompositions, and approximations of practice can be used to help all teachers learn a new teaching practice.

**SUPPORTING MATHEMATICS TEACHER EDUCATOR LEARNING WITH PRACTICAL MEASURES OF PRACTICE-BASED PEDAGOGIES**

Jason Brasel, University of Michigan  
Monica Gonzalez, East Carolina University

We describe our efforts to develop and pilot a practical measure to support of the enactment of practice-based pedagogies. In particular, we share an instrument focused on the pedagogy of rehearsal that supports MTEs' improvement efforts as they lead rehearsals.

**Session 28**

Phoenix E

**BRIEF REPORT SESSION: INNOVATION IN RECRUITMENT AND RETENTION OF TEACHERS****AN INTERACTIONAL ANALYSIS OF MATHEMATICS TEACHING FELLOW RETENTION IN NYC SCHOOLS**

Andrew Brantlinger, University of Maryland  
Laurel Cooley, Brooklyn College, CUNY

This paper reports on a quantitative analysis of the retention of 620 alternatively certified mathematics teachers. We show that the retention of different teacher subgroups is highly malleable, shaped by both training and school contexts.

**THE CHALLENGES AND SUCCESSES OF RECRUITING STEM TEACHERS FOR ASU'S NOYCE SCHOLARSHIP PROGRAM**

Pamela Harris, Arizona State University  
Terri L. Kurz, Arizona State University  
Tirupalavanam G. Ganesh, Arizona State University  
Penny Dyer, Arizona State University

We created a framework that connects a community of learners to improve the quality and quantity of STEM teachers in high-needs districts after receiving an NSF Noyce grant. We highlight recruitment techniques that increased the number of teacher candidates.

**Session 29***Mathematics Content and Curriculum**Extended Session*

South Mountain

**DEFINING CORE PRACTICES FOR MATHEMATICAL MODELING FOR ELEMENTARY MATHEMATICS TEACHERS**

Jennifer M. Suh, George Mason University

Erin E. Turner, The University of Arizona

Amy Roth McDuffie, Washington State University

Julia Aguirre, University of Washington, Tacoma

Sara Birkhead, George Mason University

This workshop is aimed at informing the modeling-interested community about teaching practices to support (early) mathematical modeling connected to the elementary curriculum and about ways modeling fits well with visions of effective teaching and ambitious teacher development.

**Session 30***Mathematics Pedagogy**Extended Session*

Estrella

**IDENTIFYING INITIAL RECOMMENDATIONS FOR INFUSING MATHEMATICAL WRITING WITHIN TEACHER PREPARATION PROGRAMS**

Madelyn Colonnese, University of North Carolina, Charlotte

Tutita M. Casa, University of Connecticut

Opportunities for K-12 students to communicate reasoning is an important aspect of mathematics learning. In this working group, we will discuss ways to support preservice teachers in learning about how to engage their future students in reasoning through written discourse.

**Session 31***Equity, Social Justice, and Mathematics Teacher Education**Extended Session*

Maryvale B

**BUT I'M NOT CREATIVE ENOUGH! SUPPORTING NOVICE TEACHERS: CULTURALLY RELEVANT PEDAGOGY AND SOCIAL JUSTICE MATH**

Alice L. Cook, Johns Hopkins University

Emily J. Yanisko, Urban Teachers, Baltimore

But I'm not creative enough for CRP! During our social justice math task, students asked if I voted for Trump! In this workshop, we 1)present a task analysis; 2)share tasks; 3)discuss supporting and eliciting more robust CRP and SJM tasks.

**Session 32***Equity, Social Justice, and Mathematics Teacher Education**Extended Session*

Encanto B

**CONSIDERING QUANTITATIVE, SOCIOCULTURAL, SPATIAL, AND CRITICAL WAYS OF KNOWING IN PRESERVICE TEACHER EDUCATION**

Travis Weiland, Appalachian State University

Lisa Poling, Appalachian State University

This session will present a series activities developed to explicitly highlight multiple ways of knowing in elementary preservice teacher education in a statistics content unit. Dynamic online tools will be used to explore data as part of the activities.

**Session 33** Desert Sky  
*Mathematics Pedagogy*  
*Individual Session*

### DEVELOPING PRESERVICE AND INSERVICE TEACHERS ABILITY TO TEACH PROOF IN HIGH SCHOOL GEOMETRY

Wayne Nirode, Miami University  
 Brian Boyd, Wright State University

This session shares a five-part proof progression that focuses on developing teachers ability to facilitate and support student learning of proof. Participants will gain hands-on experience with this field-tested progression that is grounded in research on teaching and learning proof.

**Session 34** Cave Creek  
*Professional Development*  
*Individual Session*

### REFLECTING ON SCALING PROFESSIONAL DEVELOPMENT, A DECADE IN: FINDINGS, METHODOLOGY, AND PERSISTENT QUESTIONS

Scott Kaschner, Butler University  
 Aubrey Neihaus, The University of Arizona  
 Rebecca McGraw, The University of Arizona

We will share about the national scaling of a teacher professional development program over ten years. This will contribute to the ongoing discussion of lessons learned in scaling, methodologies for studying scaling, and persistent questions around scaling professional development.

**Session 35** Ahwatukee A  
*Teaching and Learning with Technology*  
*Individual Session*

### CONTRASTING SOCIOMATHEMATICAL NORMS IN LESSONS WITH/OUT INTERACTIVE SIMULATIONS

Sebnem Atabas, Florida State University

We describe the sociomathematical norms in a middle-school mathematics classroom in lessons with/out the use of interactive simulations. We ask attendees to think critically about the notion of norms in light of evidence of contrasting norms within the same classroom.

**Session 36** Ahwatukee B  
*Equity, Social Justice, and Mathematics Teacher Education*  
*Individual Session*

### SEEING THE FOREST THROUGH THE TREES: MTES MAKING SENSE OF MULTIPLE PERSPECTIVES ON EQUITY

Kathleen Jablon Stoehr, Santa Clara University  
 Carlos A. LopezLeiva, University of New Mexico  
 Anthony Fernandes, University of North Carolina, Charlotte  
 Belinda Pickett Edwards, Kennesaw State University

This session focuses on supporting MTEs in the critical work of preparing new teachers to create equitable and socially just mathematics classrooms for all students. Participants will engage with two modules that directly address this key issue.

**Session 37** Laveen A  
*Mathematics Content and Curriculum*  
*Individual Session*

### I USED TO THINK, NOW I KNOW - USING REFLECTIVE WRITING TO MAKE THINKING VISIBLE

Susan Gay, University of Kansas  
 Carol Lucas, University of Central Oklahoma

Our reflective writing task makes visible how preservice teachers' thinking changed about content and pedagogy topics. Participants will experience the task, consider sample responses from our students and course achievement data, and reflect on how similar tasks could be useful.

**Session 38** Laveen B  
*NCSM President Exchange Session*

### CREATE EQUITY FOR STUDENTS THROUGH INTENTIONAL TEACHER COLLABORATION

Mona Toncheff, NCSM: Leadership in Mathematics Education

In order to ensure equitable learning in mathematics, teachers must create it. Collaboration is key to ensuring every student learns. This session explores four key strategies needed for effective adult collaboration that results in equitable teaching and learning for students.

**Session 39** Maryvale A  
*Practice-Based Experiences for Prospective Teachers*  
*Individual Session*

### SUPPORTING THE ENACTMENT OF AMBITIOUS PRACTICES THROUGH AN ONLINE COMMUNITY

Caroline B. Ebby, University of Pennsylvania  
 Lindsay Thompson Goldsmith-Markey, University of Pennsylvania  
 Janine Remillard, University of Pennsylvania

This session focuses on how developing proficiency in an instructional routine through an online video feedback environment supports novice teachers in translating ambitious teaching practices learned in a university-based methods course into student teaching and the first year of teaching

**Session 40** Encanto A  
*Practice-Based Experiences for Prospective Teachers*  
*Individual Session*

### THREADING PROJECT-BASED LEARNING (PBL) IN TEACHER PREPARATION CLINICAL RESIDENCY PROGRAM

Jean S. Lee, University of Indianapolis  
 Deb Sachs, University of Indianapolis

We provide an overview of our teacher preparation clinical residency model that emphasizes PBL through the delivery and design of program coursework while teacher candidates design PBL units to use in their clinical residency classrooms.

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**Session 41****Phoenix A***Mathematics Pedagogy  
Individual Session***THE PRINCIPLES AND PRACTICES OF TEACHING AND LEARNING MATH OUTSIDE**

Katherine Baker, Elon University

We will share how we use nature as a text and context for mathematics teacher preparation. We offer our heuristic that supports teaching mathematics in outdoor environments in ways that foster learning and connections to nature for children and teachers.

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**Session 42****Phoenix B***Individual Session***ARE WE PROVIDING HIGH-QUALITY MATHEMATICS INSTRUCTION FOR ALL?: HIGHLIGHTS FROM THE 2018 NSSME+**

Kristen Malzahn, Horizon Research, Inc.

This session shares results from the 2018 NSSME+, which highlights a number of disparities in students' mathematics learning opportunities. Findings about instruction and teacher preparation and professional learning opportunities will be shared. Participants will consider implications for mathematics teacher educators.

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**Session 43****Phoenix D****BRIEF REPORT SESSION: PARTNERING WITH COMMUNITIES****COMMUNITY MATH PROJECT: PARTNERING UNIVERSITIES, PROSPECTIVE TEACHERS, AND COMMUNITY CENTERS TO FACILITATE MATHEMATICS TUTORING FOR PARENTS**Emily Bonner, The University of Texas, San Antonio  
Crystal Kalinec-Craig, The University of Texas, San Antonio  
Denisse Maribel Hinojosa, The University of Texas, San Antonio

This session will report on the Community Math Project, a collaborative program involving higher education partners and community centers. The focus of this presentation is a tutoring program that pairs a prospective teacher with a parent in a community center.

**ELEMENTARY MATHEMATICS PRESERVICE TEACHERS LEARNING FROM AND WITH FAMILIES ON A COMMUNITY WALK**

Traci Kelley, The University of Texas, San Antonio

This study examines the reflections of preservice teachers from two semester cohorts of an elementary math approaches course, and participating family members, about a community walk activity that was planned by the participating community members.

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**Session 44****Phoenix E****BRIEF REPORT SESSION: FOCUSING ON STUDENTS****ELEMENTARY LATINX STUDENTS' INTERPRETATION OF THEIR MATHEMATICS TEACHERS' EXPECTATIONS**

Carlos Nicolas Gomez, Clemson University

Stacy R. Jones, Clemson University

Hilary Tanck, Clemson University

This study investigates how Latinx students in grades 3-5 interpret their mathematics teacher's goals for them. We discuss themes found among our participants and implications for constructing more meaningful goals will be discussed.

**THE AFTERMATH: INTERVENTION TECHNIQUES TO AID STUDENTS DISPLACED BY NATURAL DISASTERS IN MATHEMATICAL ACHIEVEMENT**

Brianna Ashley Kurtz, University of Central Florida

The United States ranks fifth globally in internally displacement by natural disasters (IDMC, 2017). This report showcases practices to assist students in mathematics education recovery post-disaster interruption, highlighting a successful multiple case study of students affected by Hurricane Maria.





## THURSDAY AFTERNOON BREAK

## PHOENIX BALLROOM FOYER & ENCANTO FOYER

This is a great time to stretch, network with colleagues, and visit the exhibitors.



### Session 45

### Desert Sky

#### BRIEF REPORT SESSION: TEACHING GEOMETRY WITH TECHNOLOGY

#### CRITIQUING SECONDARY STUDENTS' REASONING WITHIN STATIC AND DYNAMIC GEOMETRY ENVIRONMENTS: ANALYZING PSTS' SPECIALIZED CONTENT KNOWLEDGE

Vecihi Serbay Zambak, Monmouth University

The session will examine the relationship between PSTs' SCK (i.e., understanding of hypothetical secondary students' thinking within static and dynamic geometry environments), their technology perspectives, and argumentation schemes. Participants will explore and discuss PSTs' interpretations of static and dynamic representations.

#### PRESERVICE SECONDARY MATHEMATICS TEACHERS' CONCEPTIONS OF COUNTEREXAMPLE IN NON-DYNAMIC GEOMETRY ENVIRONMENTS VS DYNAMIC GEOMETRY ENVIRONMENTS

Tuyin An, Georgia Southern University

The goal of this session is to share results of a case study that compares pre-service secondary mathematics teachers' conceptions of counterexample through working on dynamic geometry environment (DGE) tasks vs non-DGE tasks designed in the context of Euclidean geometry.

#### PRESERVICE SECONDARY MATHEMATICS TEACHERS' DEVELOPMENT OF TECHNOLOGICAL CONTENT KNOWLEDGE WHEN EXPLORING COMPOSITION OF TRANSFORMATIONS WITH GSP

Xiangquan Yao, Pennsylvania State University

This session will report on preservice secondary mathematics teachers' development of technological content knowledge when exploring composition of transformations with Geometer's Sketchpad, focusing on their representational fluency, knowledge resulting from reification, and knowledge constructed from noticing.

### Session 46

### Cave Creek

*Practice-Based Experiences for Prospective Teachers Individual Session*

#### CENTERING BUILDING RELATIONSHIPS WITH CHILDREN IN FIELD-BASED ELEMENTARY MATH METHODS

Angela C. Turrou, University of California, Los Angeles  
Nicholas Charles Johnson, San Diego State University  
Brandon McMillan, University of California, Los Angeles  
Megan Franke, University of California, Los Angeles

Prioritizing a focus on building relationships with children has supported our efforts to address issues of equity in our elementary math methods courses. Our session explores the affordances and challenges of navigating this work in field-based methods settings.

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Session 47

Ahwatukee A

## **BRIEF REPORT SESSION: PRESERVICE TEACHERS' KNOWLEDGE**

### **ELEMENTARY PRESERVICE TEACHERS' EMERGENT KNOWLEDGE OF STUDENTS AS LEARNERS OF MATHEMATICS**

Gwendolyn Lloyd, Pennsylvania State University  
Courtney Rice, Pennsylvania State University

We will describe our efforts to enhance PSTs' knowledge of students as learners of mathematics through a series of field-based methods course assignments. Examples from PSTs' reflections will be used to illustrate shifts in their views of children's understanding and development.

### **MATHEMATICAL ROUTINES THAT WILL SUPPORT STUDENTS' SENSE MAKING, UNDERSTANDING, AND REASONING**

Stacy Reeder, University of Oklahoma  
Juliana Utley, Oklahoma State University  
S. Megan Che, Clemson University

To engage their own future students in worthwhile mathematics, teacher candidates must be regularly engaged in rich mathematical activities to develop their mathematical knowledge, pedagogical knowledge, and a positive mathematical disposition. Tasks used to engage teacher candidates will be shared.

### **STRATEGIES FOR PROMOTING KNOWLEDGE INTEGRATION IN CONTENT COURSES FOR PRESERVICE TEACHERS**

J. Vince Kirwan, Kennesaw State University  
David D. Barker, Illinois State University

We will present empirically-based mathematics teacher educator actions that have the potential to promote knowledge integration. Data on the influence of these strategies in a content course will be presented. Attendees will discuss potential implementation into their content courses.

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Session 48

Ahwatukee B

*Mathematics Content and Curriculum*  
*Individual Session*

### **FLUENCY DEVELOPMENT IN CONTENT COURSES FOR ELEMENTARY TEACHERS**

C. David Walters, Weber State University

I will share details of an initiative undertaken to restructure a content course sequence for future elementary teachers to better help them build procedural fluency from conceptual understanding. Participants will engage with and discuss fluency-building activities from the courses.

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Session 49

Laveen A

*Professional Development*  
*Individual Session*

### **EMBEDDED DAYS FOR PROFESSIONAL DEVELOPMENT: STRUCTURE, ACTIVITIES, AND RESULTS**

Dusty Jones, Sam Houston State University  
John H. Lamb, The University of Texas, Tyler

Embedded Days are a key component of a professional development project designed for mathematics teachers in rural areas. Teachers have found these to be rewarding in a number of ways. We will be define Embedded Days and discuss their implementation.

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Session 50

Laveen B

### **BRIEF REPORT SESSION: PROBABILITY AND STATISTICS**

#### **DEVELOPING TASKS FOR INVESTIGATING INFORMAL NOTIONS OF RANDOMNESS**

Joshua Hertel, University of Wisconsin, La Crosse

In this presentation, we discuss a task designed to investigate informal notions of randomness held by elementary preservice teachers. We will consider task development, examine findings from implementation, and discuss how we prepare preservice teachers to teach probability and statistics.

#### **LEARNING FROM THE FIELD: BRINGING STATISTICAL LITERACY PRACTICES FROM MIDDLE SCHOOL CLASSROOMS TO THE UNIVERSITY**

Susan Ophelia Cannon, Mercer University

This project works to draw on the pedagogies and practices of two in-service teachers who were successful in implementing a critical statistical literacy curriculum to middle schoolers to create a methods course for preservice middle grades mathematics teachers.

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Session 51

Estrella

*Equity, Social Justice, and Mathematics Teacher Education*  
*Discussion Session*

### **SUPPORTING MATHEMATICS TEACHERS' UNDERSTANDING OF PRIVILEGE AND OPPRESSION: A CRITICAL EXAMINATION**

Tonya Bartell, Michigan State University  
Courtney Koestler, Ohio University  
Joel Amidon, University of Mississippi

We discuss two activities aimed to support mathematics teachers in understanding that people's identity groups fall into both privileged and marginalized, and that oppression operates on multiple levels. We consider the activities, their facilitation, teachers' responses, and ongoing reflections.

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Session 52

Maryvale A

*Mathematics Pedagogy*  
*Individual Session*

### **PREPARING TO LAUNCH A TASK: WHAT DOES IT LOOK LIKE FOR PRE-SERVICE TEACHERS?**

Rachel B. Snider, The College of New Jersey  
Mark A. Creager, University of Southern Indiana  
Christopher W. Parrish, University of South Alabama

In this session, we present a unit designed to support secondary preservice teachers in learning to launch complex tasks. We focus specifically on how PSTs plan to launch a task before in-class peer rehearsals.

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**Session 53****Maryvale B***Mathematics Content and Curriculum  
Individual Session***GEOMETRIC TRANSFORMATIONS: ALIGNMENT OF  
TEACHERS MATHEMATICAL GOALS TO RESEARCH-BASED  
LEARNING TRAJECTORIES**Porter Nielsen, Brigham Young University  
Dawn Teuscher, Brigham Young University  
Janessa Cloward, Brigham Young University

In this session, we examine multiple middle grades teachers' mathematical goals and how much time students spend during class working towards these goals. We also examine if the teachers' goals are aligned or not aligned with research-based learning trajectories.

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**Session 54****Encanto A***Teaching and Learning with Technology  
Individual Session***LEVERAGING DYNAMIC GEOMETRY SOFTWARE TO  
PROMOTE AUTHENTIC MATHEMATICS**Brian Boyd, Wright State University  
Wayne Nirode, Miami University

This session shares a project where students pose questions to investigate with Dynamic Geometry Software, construct proofs of their conjectures, and get feedback along the way from peers and experts. Bring your own device to the session for hands-on experience.

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**Session 55****Encanto B***Practice-Based Experiences for Prospective Teachers  
Discussion Session***RETHINKING THE STUDENT TEACHING EXPERIENCE:  
ENGAGING IN A DIALOGUE ABOUT PAIRED-PLACEMENT  
STUDENT TEACHING**Kelly Edenfield, University of Georgia  
Sharon Christensen, Brigham Young University

Join us in a discussion around the purposes of student teaching, the design of existing paired-placement student teaching experiences, and how such experiences can be designed to better align with current purposes of student teaching.

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**Session 56****Phoenix D***Development of Mathematics Teacher Educators  
Individual Session***DEVELOPING COACHING SKILLS FOR REHEARSALS**Emily Miller, West Chester University  
Jess Jensen, California Polytechnic State University, San Luis Obispo  
Preservice teachers should have many opportunities to rehearse the practice of teaching. However, just as important is the opportunity for teacher educators to practice productive coaching moves. This session will engage participants in discussing and practicing three such coaching moves.

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**Session 57****Phoenix E***Equity, Social Justice, and Mathematics Teacher Education  
Discussion Session***AN INTERSECTIONAL ANALYSIS OF JUSTICE-ORIENTED  
MATHEMATICS TEACHING**

Brette Garner, University of Denver

In this session, presenters will share examples of urban secondary teachers incorporating sociopolitical contexts into mathematics lessons. Participants will discuss the affordances and tensions in implementing justice-oriented pedagogy and synthesize implications for developing more equitable instruction.

**Session 58**

*Equity, Social Justice, and Mathematics Teacher Education*  
Extended Session

South Mountain

**CONNECTING PRESERVICE TEACHERS' LEARNING OF MATHEMATICS AND PEDAGOGY TO SOCIAL JUSTICE AND CULTURALLY RESPONSIVE TEACHING**

Rebecca McGraw, The University of Arizona

Participants will engage in an activity connecting geometry, politics, and law, examine pre-service teachers' thinking about equity as it relates to written curriculum materials, and consider opportunities to connect the histories of mathematics and education.

**Session 59**

*Mathematics Education Policy and Program Issues*  
Extended Session

Phoenix A

**HUMANIZING APPROACHES TO GRADING WITH MATHEMATICS PRE-SERVICE TEACHERS: NAVIGATING AND PUSHING BEYOND SYSTEMS**

Mary Candace Raygoza, Saint Mary's College of California

Alyson E. Lischka, Middle Tennessee State University

Amy Tanner, Brigham Young University

Lorraine M. Males, University of Nebraska, Lincoln

Jamalee Stone, Black Hills State University

Frances K. Harper, University of Tennessee, Knoxville

Patrick Lane Sullivan, Missouri State University

This session highlights examples of praxis that challenge traditional grading practices. Drawing on collective insights of participating MTEs, we will identify next steps in our praxis of humanizing grading, brainstorm strategies for systemic change, and develop a shared resource.

**Session 60**

*Equity, Social Justice, and Mathematics Teacher Education*  
Extended Session

Phoenix B

**A CRITICAL PERSPECTIVE ON EQUITY PEDAGOGIES AND RACE IN MATHEMATICS EDUCATION**

Nicole L. Louie, University of Wisconsin, Madison

Maria del Rosario Zavala, San Francisco State University

Teresa K. Dunleavy, Vanderbilt University

Crystal Kalinec-Craig, The University of Texas, San Antonio

Nicole Bannister, Clemson University

Equity-oriented pedagogies may provide classroom strategies that are easily adopted without attention to race and power, or present rich theorizing that leaves practical details vague. Join us to put complex instruction and critical mathematics in dialogue to address these issues.

**Session 61***Mathematics Content and Curriculum**Individual Session*

Desert Sky

**GEOMETRIC TRANSFORMATIONS & DESMOS: REFLECTIONS FROM A STUDY ON CURRICULAR REASONING**

Travis Austin Olson, University of Nevada, Las Vegas

Shannon W. Dingman, University of Arkansas

We focus on data collected within a larger study into middle grades mathematics teachers' curricular reasoning. Specifically, we present data from three teachers' integration of Desmos' Transformation Golf: Rigid Motion activity into their 8th grade unit on geometric transformations.

**Session 62***Mathematics Pedagogy**Individual Session*

Cave Creek

**CREATIVE MATHEMATICAL REASONING AND KEY CURRICULAR CONTENT AS AN EVALUATIVE FRAMEWORK FOR PRESERVICE TASK ENGAGEMENT**

Tami Martin, Illinois State University

Craig Cullen, Illinois State University

Roger Day, Illinois State University

We proposed that the criteria of engagement in creative mathematical reasoning, coupled with in-depth explorations with concepts connected to future teaching assignments may be a reasonable way to assess the potential quality of a task for preservice teacher education experiences.

**Session 63***Professional Development**Individual Session*

Ahwatukee A

**THE VIABILITY AND IMPACT OF BUILDING DISTRICT MATHEMATICAL PROFESSIONAL DEVELOPMENT CAPACITY**

Jodie Novak, University of Northern Colorado

We describe a PD model where university faculty work with district math coaches to train elementary teachers to offer high quality mathematical professional development to their peers. Evaluation data suggest the model scales, impacts practice and builds district PD capacity.

**Session 64***Practice-Based Experiences for Prospective Teachers**Individual Session*

Ahwatukee B

**MANY PERSPECTIVES, ONE VISION: LEARNING TO RESPOND TO STUDENT THINKING BY REFLECTING ON SHARED EXPERIENCE**

Cody L. Patterson, Texas State University

Hiroko K. Warshauer, Texas State University

We will share results of a study of how preservice and inservice teachers, through small-group discussions of observations of a shared classroom context, engage in collaboration around the practice of interpreting and responding to instances of nonstandard student thinking.

**Session 65**

Laveen A

**BRIEF REPORT SESSION: ELICITING STUDENT THINKING COACHING STUDENT TEACHERS TO ELICIT STUDENTS' MATHEMATICAL THINKING**

Luke T. Reinke, University of North Carolina, Charlotte

We report on a case study of two student teachers coached to elicit student thinking. A trajectory for learning to elicit and interpret student thinking will be proposed and the coaching moves used to support the candidates will be identified.

**TRANSFER OF ELICITING AND INTERPRETING STUDENT THINKING (EIST) FROM LITERACY TO MATHEMATICS**

Jess Jensen, California Polytechnic State University, San Luis Obispo

Melissa A. Gallagher, University of Louisiana, Lafayette

Findings from this study indicate that multiple stakeholders should be involved in preparing mathematics teachers, as most EIST skills transfer from literacy to mathematics methods. This project helps determine how a series of education courses could be designed more synergistically.

**Session 66**

Laveen B

**BRIEF REPORT SESSION: SECONDARY TEACHERS' VIEWS OF TEACHER PREPARATION****COMING FULL CIRCLE: WHAT DO SECONDARY TEACHERS VALUE IN PROGRAM PREPARATION?**

Janet A. White, Millersville University

During 2018-2019, the presenter visited over 45 program alumni in secondary schools. These mathematics teachers' opinions on their own preparation in terms of AMTE's SPTM and specific recommended topics for inclusion in a methods course will be shared and discussed.

**IS THIS CO-TEACHING? A REVIEW OF GRADUATE TEACHING INTERNSHIP EXPERIENCES**

Jessica S. Allen, University of South Carolina

Using existing literature, reflective journals, and student surveys, two graduate students review their experiences within similar teaching internships to analyze the degree to which true co-teaching is occurring. Analysis includes a review of planning, teaching, and grading within participants' internships.

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**Session 67****Estrella****BRIEF REPORT SESSION: EQUITY AND PRESERVICE TEACHERS****“GAP-GAZING” TO DISRUPT, NOT REPRODUCE, HARMFUL STEREOTYPES**

Julia Przybyla-Kuchek, University of Georgia

I share an activity designed for secondary preservice teachers using NAEP mathematics achievement data to empowers preservice teachers to draw conclusions and challenge their assumptions about what produces achievement gaps and contributes to inequity in mathematics education.

**SECONDARY MATHEMATICS TEACHER CANDIDATES' PERSPECTIVES ABOUT STRATEGIES THAT CAN SUPPORT EQUITABLE LEARNING OPPORTUNITIES**Ruthmae Sears, University of South Florida  
Lakesia L. Dupree, University of South Florida  
Cynthia Ann Castro-Minnehan, University of South Florida

This presentation will describe secondary mathematics teacher candidates' perspectives about equity, and the complexities and challenges that may impact it within high-needs schools. We will also identify strategies teacher candidates perceive can support equitable learning opportunities.

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**Session 68****Maryvale A***Mathematics Content and Curriculum  
Individual Session***USING MATHEMATICAL NOTICING IN DEEPENING MATHEMATICAL UNDERSTANDING FOR TEACHING THE CONCEPT OF FUNCTION**

Mary Kathleen Heid, Pennsylvania State University

Courses for secondary teachers involving mathematical noticing can deepen mathematical understanding. Examples include (a) extending the domain of application for familiar operations on function and (b) pushing boundaries of familiar functions by enveloping seemingly distinct concepts under a single concept.

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**Session 69****Maryvale B***Mathematics Content and Curriculum  
Individual Session***A MEASUREMENT LESSON LEVERAGING QUANTITATIVE REASONING FOR ELEMENTARY PROSPECTIVE TEACHERS**

Hwa Young Lee, Texas State University

In this session, I share an introductory lesson on measurement for a geometry content course for elementary prospective teachers, present how the lesson helped address central ideas of measurement across multiple quantities, and discuss implications and limitations of the lesson.

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**Session 70****Encanto A***Mathematics Pedagogy  
Individual Session***ADDRESSING MATHEMATICS ANXIETY IN PRESERVICE TEACHERS THROUGH CREATING EXPLICIT AWARENESS IN THE CLASSROOM**

Heidi B. Hansen, Bemidji State University

This session outlines a research project in which the explicit discussion and study of mathematics anxiety was included in the curriculum of a mathematics content course for preservice elementary teachers as an intervention for decreasing anxiety.

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**Session 71****Encanto B***Teaching and Learning with Technology  
Individual Session***USING ROBOTICS TO EMPHASIZE THE M IN STEM**Amanda Thomas, University of Nebraska, Lincoln  
Kelley Buchheister, University of Nebraska, Lincoln  
Amy Sokoll, University of Nebraska, Lincoln

This session will engage mathematics teacher educators (MTEs) in hands-on experiences with coding robots. The presenters will also disseminate findings from a project in which teachers of mathematics used robotics to design STEM learning activities that emphasized mathematics content.

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**Session 72****Phoenix D***Professional Development  
Individual Session***PRACTICE-BASED PROFESSIONAL DEVELOPMENT: DILEMMAS IN BALANCING PEDAGOGIES OF ENACTMENT AND PEDAGOGIES OF INVESTIGATION**Meghan Shaughnessy, University of Michigan  
Nicole M. Garcia, University of Michigan  
Jillian Peterson Mortimer, University of Michigan  
Deborah Loewenberg Ball, University of Michigan

Recent efforts have centered on designing professional learning that is focused on teaching practice. This session will support collective conversation around the strategic use of pedagogies of investigation and enactment and develop critical questions to ask to balance their use

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**Session 73****Phoenix E***Practice-Based Experiences for Prospective Teachers  
Individual Session***PRESERVICE TEACHERS' UNDERSTANDINGS OF THE PROFESSIONAL OBLIGATIONS OF MATHEMATICS TEACHING**Nickolaus A. Ortiz, Michigan State University  
Kristen N. Bieda, Michigan State University

We share anecdotes from PSTs and highlight the prevalence of descriptions aligned with the professional obligations of mathematics teaching, and those which take precedence after PSTs engage in their first teaching experience within this innovative model for practice teaching.

**THURSDAY, FEBRUARY 6, 2020**

**5:30 PM - 6:30 PM**

**A / M T E**

**VALLEY OVERLOOK**

**RECEPTION FOR GRADUATE STUDENTS & EARLY CAREER FACULTY**

Graduate students and early career faculty in their first three years are invited to join the AMTE Board of Directors and leadership in Valley Overlook (located on the Fourth Level) for a reception. Refreshments will be served.



**FRIDAY, FEBRUARY 7, 2020**

**6:45 AM - 7:45 AM**

**A / M T E**

Conference participants have two options for breakfast.

**ADVOCACY AND EMERGING ISSUES BREAKFAST**

**PHOENIX D**

Julia Aguirre, University of Washington, Tacoma  
Cynthia Anhalt, University of Arizona  
Erin Turner, University of Arizona

The Advocacy Breakfast is a long-standing, AMTE tradition in which speakers are invited to share their insights on advocacy in mathematics education. This year we will feature panelists from two projects, *Mathematical Modeling with Cultural and Community Contexts* and *Trajectories of Black Mathematics Teachers*. The panelists will share their experiences engaging in advocacy work with teachers and communities and provide ideas for others to get involved in this important work. There will also be time for audience questions. Everyone is invited to attend! We hope to see you there.

**FRIDAY BREAKFAST**

**PHOENIX C**

Join colleagues for breakfast and informal conversation.



# OVERVIEW OF FRIDAY MORNING, FEBRUARY 7, 2020

	8:00 AM - 9:00 AM	9:15 AM - 10:00 AM
<b>Desert Sky</b>	74. <i>Brief Report Session: Equity, Social Justice, and Mathematics Teacher Education 1</i> - Jones & Gomez; Byun; Jackson, Taylor, & Buchheister	89. <i>Dear Math... Examining Women's Self-Identified Critical Experiences in Mathematics</i> - Bertolone-Smith & MacDonald
<b>Cave Creek</b>	75. <i>Going Beyond the Comfort Zone: Transitioning to Ambitious Teaching Practices through Video Peer Coaching</i> - Capen, Birkhead, & Suh	90. <i>Preparing Mathematics and Special Education Teachers to Engage in Content-Specific Consultations: Research Across Four Continents</i> - van Ingen & Eskelson
<b>Ahwatukee A</b>	76. <i>Brief Report Session: Perspectives of Mathematics</i> - Watson; Abel; Lamb	91. <i>Brief Report Session: Research in Teacher Education</i> - Melville; Callis & McNally
<b>Ahwatukee B</b>	77. <i>Building Mathematical Knowledge in Otherwise Pedagogically-Focused Secondary Teacher Preparation Programs</i> - Kimmerling & Chesler	92. <i>Second Wave Challenges to Improving Instruction Across a District: Plateaus and Threats</i> - Lawler & Leaf
<b>Laveen A</b>	78. <i>Theoretically Framing the Pedagogy of Learning to Teach Mathematics with Technology</i> - Bailey, McCulloch, Cayton, Reed, & Fye	93. <i>The Role of Voice Thread in Supporting Effective Mathematical Discussions Online</i> - Dean & Goodson-Espy
<b>Laveen B</b>	79. <i>Brief Report Session: Teaching Geometry and Measurement</i> - Bharaj; Hardison & Lee; Boyce	94. <i>Learning to plan instructional units: reexamining the grain-size in teacher preparation</i> - Males & Buchbinder
<b>South Mountain</b>	87. <i>Teacher and Student Angles: Building a Critical Mathematics Video Repository</i> - Dunleavy, Raygoza, Jessup, Yeh, & Krause	
<b>Estrella</b>	80. <i>Math Work Station Project: Supporting Preservice Teachers to Notice and Analyze Mathematical Thinking in Photographs</i> - Roller & Marin	95. <i>Brief Report Session: Differentiation</i> - Saclarides & Harbour; van den Kieboom
<b>Maryvale A</b>	81. <i>Teacher Support for Argumentation: An Examination of Beliefs and Practice</i> - Conner AMTE 2020 Excellence in Scholarship Award	96. <i>Preservice Teachers' Views of Mathematics Instruction Mediated by iPads</i> - Barlow & Groves-Scott
<b>Maryvale B</b>	82. <i>Exploring the Mathematical Identity of Prospective Elementary Teachers</i> - Willingham, Ruef, & Sweeny	97. <i>Toward an Antiracist Mathematics Teacher Educator Practice: A Reflective Resource</i> - Jackson, Osibodu, Byun, & Herbel Eisenmann
<b>Encanto A</b>	83. <i>Steering into the Storm: Confronting Classroom Realities with PSTs to Address Issues of Equity</i> - Sharpe, Pinter, Knapp, Woods, Lynch, & Billings	98. <i>Learn how to Incorporate Free PK-5 Math Curriculum into Your Course</i> - Harris
<b>Encanto B</b>	88. <i>Using the Process Writing Model as a Tool for Mathematics Teacher Professional Development</i> - Satyam	
<b>Phoenix A</b>	84. <i>Is It Culturally Relevant or Just Plain Racist? Examining Mathematics Homework Examples in Mainstream Media</i> - Myers	99. <i>Developing Prospective Teachers' Ability to Engage Children in Argument in an Elementary Methods Course</i> - Kline
<b>Phoenix B</b>	85. <i>Collaborating to Improve Clinical Experiences for Secondary Mathematics Teacher Candidates</i> - Strutchen, Sears, Zekowski, Mangram, & Conway	100. <i>Engaging Alumni: Linking Longitudinal Research to Program Evaluation and Innovation</i> - Harper & Cox
<b>Phoenix E</b>	86. <i>Community, Advocacy, and Mathematics Education</i> - Emerging Issues Committee	101. <i>Beginning Teachers' Ambitious Instruction: Promising Practices and Places to Grow</i> - Cavanna, Casa, & Pinter



**10:15 AM - 11:30 AM**

<b>Desert Sky</b>	102. <i>Scaling Professional Development Programs: Transitioning from Face-to-Face to Online Environments-</i> Sztajn, Carson, Knotts, Carroll, Martin, Alnizami, & Seago
<b>Cave Creek</b>	103. <i>Investigations into Connections between Teachers' Professional Noticing and Teachers' Cognitive Resources: Looking Back and Moving Forward-</i> LaRochelle, Dick, Skultety, & Thomas
<b>Ahwatukee A</b>	104. <i>Quantitative Research Instruments Relevant to Mathematics Teacher Educators-</i> Krupa, Bostic, Cavey, Harrell-Williams, Hjalmarson, & Walkowiak
<b>Ahwatukee B</b>	105. <i>Framing and Assessing Mathematical Knowledge for Teaching Proof-</i> Buchbinder, Lesseig, Cirillo, & Hempel
<b>Laveen A</b>	106. <i>Leveraging Diverse Tools to Measure Components of Mathematically Productive Classrooms-</i> Litke, Thanheiser, Heaton, & Reinholz
<b>Laveen B</b>	107. <i>Bringing Teacher Education Outdoors-</i> Weston & Baker
<b>South Mountain</b>	108. <i>Leveraging Community Funds of Knowledge to Teach Mathematics with Technology-</i> Harper & Kim AMTE 2020 NTLI Award Winner
<b>Estrella</b>	109. <i>A Mathematics Selective Alternative Teacher Certification Program (ATCP) for Urban Schools: Trajectories, Preparation and Consequences-</i> Cooley, Brantlinger, Lochard, Khalil, & Bullock
<b>Maryvale A</b>	110. <i>New Directions for Video-based Pedagogies to Enhance Teacher Noticing-</i> van Es & Dobie
<b>Maryvale B</b>	111. <i>Strategies for Supporting Technology in Mathematics Teacher Education -</i> AMTE Technology Committee
<b>Encanto A</b>	112. <i>National Science Foundation Proposals for Equity, Diversity and Inclusion in Mathematics Teacher Education-</i> Richardson
<b>Encanto B</b>	113. <i>Publishing Your Scholarly Work in an AMTE Publication: Opportunities Explored and Questions Answered -</i> AMTE Publications Division
<b>Phoenix A</b>	114. <i>Mathematical Modeling in K-12 Mathematics Teacher Preparation-</i> Aguirre & Turner
<b>Phoenix B</b>	115. <i>I Am New to Mathematics Teacher Education: Realities of Teaching, Scholarship, and Service -</i> AMTE Professional Development Committee
<b>Phoenix E</b>	116. <i>Tasks for Teachers: Approaches to the Design of Tasks for Preservice and Inservice Learners-</i> Orrill, Olanoff, Boston, Brown, Tobias, Bajwa, Thanheiser, Welder, & Candela

**Session 74**

Desert Sky

*Equity, Social Justice, and Mathematics Teacher Education***BRIEF REPORT SESSION: EQUITY, SOCIAL JUSTICE, AND MATHEMATICS TEACHER EDUCATION 1****DEVELOPING PRESERVICE TEACHERS' CRITICAL CONSCIOUSNESS**

Stacy R. Jones, Clemson University

Carlos Nicolas Gomez, Clemson University

This session describes a mathematics content course that used teaching mathematics for social justice in order to develop preservice teachers' critical consciousness. Participants will examine how preservice teachers' critical consciousness development impacts their perspectives on teaching mathematics for social justice.

**DEVELOPING THE EQUITY LITERACY OF PROSPECTIVE TEACHERS IN THEIR PRACTICE-BASED EXPERIENCE: AN APPLICATION OF EQUIP**

Sunghwan Byun, Michigan State University

I present how the use of EQUIP, a free web-based application, allowed prospective teachers to develop equity literacy against the inequitable participation of the students with minoritized social markers (e.g., students of color) in the practice-based experience.

**EQUITY NOTICING FRAMEWORK-A TOOL FOR MATHEMATICS TEACHER EDUCATORS**

Christa Jackson, Iowa State University

Cynthia E. Taylor, Millersville University of Pennsylvania

Kelley Buchheister, University of Nebraska, Lincoln

In this session, we describe our conceptualization of the Equity Noticing Framework and engage participants in a discussion on how the framework may be used as a tool in their practice.

**Session 75**

Cave Creek

*Professional Development  
Individual Session***GOING BEYOND THE COMFORT ZONE: TRANSITIONING TO AMBITIOUS TEACHING PRACTICES THROUGH VIDEO PEER COACHING**

Laurie M. Capen, George Mason University

Sara Birkhead, George Mason University

Jennifer M. Suh, George Mason University

Interactive session demonstrating professional development model focused on peer video coaching. Case study vignettes encourage participants to consider the model to engage in reflective, ambitious teaching practices that engage students in rich mathematics tasks and promoting discourse in mathematical reasoning.

**Session 76**

Ahwatukee A

**BRIEF REPORT SESSION: PERSPECTIVES OF MATHEMATICS****ELEMENTARY PROSPECTIVE TEACHERS' CONCEPTIONS OF THE NATURE OF MATHEMATICS**

Lucy Watson, Belmont University

I will discuss results from a project with elementary prospective teachers who were enrolled in content and methods courses and reflected on their understandings of and experiences with the nature of mathematics.

**HISTORICAL MATHEMATICAL PROBLEMS AND PRESERVICE TEACHERS' METAPERSPECTIVES OF MATHEMATICS**

Todd Abel, University of Central Arkansas

The report describes an exploratory study of changes in preservice teachers' metaperspectives of mathematics while engaging with historical mathematical problems. Analysis suggests some reevaluation of metaperspectives on mathematics as a discipline and the cultural-situatedness of mathematics.

**RELATIONSHIPS BETWEEN FUTURE TEACHERS' PERCEPTIONS OF MATH AS A MALE DOMAIN, ANXIETY, CONFIDENCE, AND MATH USEFULNESS**

John H. Lamb, The University of Texas, Tyler

This presentation will share survey data from over 50 graduates of a primarily female teacher preparation program. Relationships between mathematics being a male domain, mathematics anxiety, their confidence in mathematics, and their view of mathematics being a useful subject were analyzed.

**Session 77**

Ahwatukee B

*Mathematics Content and Curriculum  
Discussion Session***BUILDING MATHEMATICAL KNOWLEDGE IN OTHERWISE PEDAGOGICALLY-FOCUSED SECONDARY TEACHER PREPARATION PROGRAMS**

Christina Kimmerling, California State University, Long Beach

Joshua Chesler, California State University, Long Beach

Students of various mathematical backgrounds pursue mathematics credentials. Yet many teacher preparation programs afford limited opportunities to attend to preservice teachers' mathematical development. We will discuss strategies for focusing on mathematics, even if your program wasn't designed for it.

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**Session 78**

Laveen A

*Teaching and Learning with Technology  
Individual Session***THEORETICALLY FRAMING THE PEDAGOGY OF LEARNING TO TEACH MATHEMATICS WITH TECHNOLOGY**

Nina Gabrielle Bailey, University of North Carolina, Charlotte  
Allison McCulloch, University of North Carolina, Charlotte  
Charity Cayton, East Carolina University  
Samuel Douglas Reed, Middle Tennessee State University  
Kristen Fye, University of North Carolina, Charlotte

We share the results of a survey about the frameworks used in courses related to learning to teach mathematics with technology. Participants will discuss ways that the field might move forward in further developing and utilizing frameworks to support this work.

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**Session 79**

Laveen B

**BRIEF REPORT SESSION: TEACHING GEOMETRY AND MEASUREMENT****DESIGN OF A COHERENT UNIT FOR QUADRILATERALS**

Pavneet Kaur Bharaj, Indiana University, Bloomington

Guided by the assertion that strong conceptual understanding of quadrilaterals is possible by engaging learners in tasks involving creating own definitions, constructing shapes, exploring hierarchical relationships; we will discuss a unit designed to ensure meaningful learning experiences for the learners.

**FUNKY PROTRACTORS: EXAMINING UNCONVENTIONAL ANGLE MEASUREMENT TOOLS TO SPARK CLASSROOM CONVERSATIONS**

Hamilton Hardison, Texas State University  
Hwa Young Lee, Texas State University

Could this funky protractor be right? We present a task we designed to engage PSTs in conversations about whether particular (unconventional) tools are appropriate for measuring angles. We report on PSTs' engagement with the task to support MTEs subsequent implementations.

**SUPPORTING COHERENT MEANINGS AND REPRESENTATIONS OF GEOMETRIC (IN)CONGRUENCE**

Steven Boyce, Portland State University

I will lead a discussion of two aspects of PTs' thinking about congruence that are problematic and encouraging in relation to their preparation for teaching the axiomatic approach advocated by the CCSS and MET II.

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**Session 80**

Estrella

*Mathematics Content and Curriculum  
Discussion Session***MATH WORK STATION PROJECT: SUPPORTING PRESERVICE TEACHERS TO NOTICE AND ANALYZE MATHEMATICAL THINKING IN PHOTOGRAPHS**

Sarah A. Roller, The University of Alabama in Huntsville  
Katherine Ariemma Marin, Stonehill College

We share an assignment designed to assess PSTs' abilities to attend, interpret, and respond to students' mathematical thinking through the use of photographs. Results indicate PSTs' photographs focused on mathematics, but demonstrated strengths and weaknesses in learning progression use.

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**Session 81**

Maryvale A

*AMTE 2020 Excellence in Scholarship Award***TEACHER SUPPORT FOR ARGUMENTATION: AN EXAMINATION OF BELIEFS AND PRACTICE**

AnnaMarie Conner, University of Georgia

Supporting students in making mathematical arguments is an important part of discourse practices in mathematics classrooms. This session explores teachers' argumentation practices and beliefs about mathematics, teaching, and proof, showing which beliefs are visible in their support for argumentation.

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**Session 82**

Maryvale B

*Mathematics Pedagogy  
Individual Session***EXPLORING THE MATHEMATICAL IDENTITY OF PROSPECTIVE ELEMENTARY TEACHERS**

James Chris Willingham, James Madison University  
Jennifer Ruef, University of Oregon  
Shannon P Sweeny, Northern Arizona University

We present an analysis of prospective elementary teachers' attitudes and beliefs towards success in mathematics, through the lens of their vision of mathematics, perceived competence in mathematics, and emotional disposition towards mathematics first developed by Di Martino and Zan (2010).

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**Session 83**

Encanto A

*Practice-Based Experiences for Prospective Teachers  
Discussion Session***STEERING INTO THE STORM: CONFRONTING CLASSROOM REALITIES WITH PSTS TO ADDRESS ISSUES OF EQUITY**

Charlotte Dunlap Sharpe, Syracuse University  
Holly Henderson Pinter, Western Carolina University  
Melinda Knapp, Oregon State University, Cascades  
Dawn Woods, Oakland University  
Sararose Lynch, Westminster College  
Esther Marie Billings, Grand Valley State University

What happens when MTEs steer into the storms PSTs usually navigate alone? Mediated Field Experiences (MFEs) position MTEs to join with PSTs in the authentic and worthwhile challenges of providing ambitious and equitable mathematics instruction to K12 students.

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**Session 84**

Phoenix A

*Equity, Social Justice, and Mathematics Teacher Education  
Individual Session***IS IT CULTURALLY RELEVANT OR JUST PLAIN RACIST? EXAMINING MATHEMATICS HOMEWORK EXAMPLES IN MAINSTREAM MEDIA**

Marrielle Myers, Kennesaw State University

After engaging in a summer book club focused on equity, culturally relevant pedagogy, and teaching mathematics for social justice, I asked preservice teachers to comment on and critique mathematical tasks from mainstream media. Examples and implications for practice are shared.

**Session 85**

*Collaborations and Partnerships  
Symposium*

**Phoenix B****COLLABORATING TO IMPROVE CLINICAL EXPERIENCES FOR SECONDARY MATHEMATICS TEACHER CANDIDATES**

Marilyn E. Strutchens, Auburn University  
Ruthmae Sears, University of South Florida  
Jeremy Zelkowsky, The University of Alabama  
Charmaine Mangram, University of Hawaii  
Basil Conway, Columbus State University

Clinical Experiences Research Action Cluster members of the Mathematics Teacher Education Partnership will present work related to early field and student teaching experiences of secondary teacher candidates. After presentations, panelists and participants will converse in small groups about clinical experiences.

**Session 86**

*Committee Meetings*

**Phoenix E****COMMUNITY, ADVOCACY, AND MATHEMATICS EDUCATION**

AMTE Advocacy Committee

Engage with Advocacy Breakfast panelists to learn more about issues raised at the breakfast, including how to keep engage in advocacy with teachers and communities. We will also share resources for doing this work so you can get started!

**FRIDAY, FEBRUARY 7, 2020****8:00 AM - 10:00 AM****Session 87**

*Equity, Social Justice, and Mathematics Teacher Education  
Extended Session*

**South Mountain****TEACHER AND STUDENT ANGLES: BUILDING A CRITICAL MATHEMATICS VIDEO REPOSITORY**

Teresa K. Dunleavy, Vanderbilt University  
Mary Candace Raygoza, Saint Mary's College of California  
Naomi Jessup, Georgia State University  
Cathery Yeh, Chapman University  
Gladys Krause, William and Mary

Calls for the use of video for professional practice are prolific. However, calls for the use of video that features critical mathematics are notably absent. We seek to grow a video repository of classrooms highlighting and leveraging critical mathematics practices.

**Session 88**

*Professional Development  
Extended Session*

**Encanto B****USING THE PROCESS WRITING MODEL AS A TOOL FOR MATHEMATICS TEACHER PROFESSIONAL DEVELOPMENT**

V. Rani Satyam, Virginia Commonwealth University

In this workshop, we will introduce participants to the process writing model, engage participants in writing and sharing their own teacher narrative, and talk about how to use the process writing model as a form of mathematics teacher professional development.

**Session 89**

*Equity, Social Justice, and Mathematics Teacher Education*  
Individual Session

Desert Sky

**DEAR MATH... EXAMINING WOMEN'S SELF-IDENTIFIED CRITICAL EXPERIENCES IN MATHEMATICS**

Claudia Marie Bertolone-Smith, California State University, Chico  
Beth L. MacDonald, Utah State University

This study investigated critical experiences in math learning from women preservice teachers. Participants wrote a letter to math and drew self-portraits of themselves learning math. Discussion will center on results and implications for mathematics education practices.

**Session 90**

*Collaborations and Partnerships*  
Individual Session

Cave Creek

**PREPARING MATHEMATICS AND SPECIAL EDUCATION TEACHERS TO ENGAGE IN CONTENT-SPECIFIC CONSULTATIONS: RESEARCH ACROSS FOUR CONTINENTS**

Sarah van Ingen, University of South Florida  
Samuel L. Eskelson, University of Northern Iowa

We report findings from an international team of teacher educators that developed a method of preparing mathematics and special education teachers to consult with each other to provide equitable instruction to students with special education needs in inclusive classrooms.

**Session 91****BRIEF REPORT SESSION: RESEARCH IN TEACHER EDUCATION****TEACHER PLANNING PRACTICES: UNDERSTANDING U.S. TEACHERS' CONCEPTIONS ABOUT PLANNING**

Matthew Melville, University of Delaware

A study done to create a planning profile for U.S. teachers. This profile will allow for a comparison to Japanese teachers' planning practices. The resulting comparison will enable discussions about how to improve planning practices for U.S. teachers.

**UNDERGRADUATE RESEARCH IN THE TEACHER PREPARATION PROGRAM: ANALYZING TWO MODELS**

Laura Callis, Curry College  
Jennifer McNally, Curry College

Two mathematics teacher educators piloted two different models of engaging PSTs in teacher research to orient PSTs toward learner's mathematical thinking, apprentice them to the tools of teacher research, and address logistical challenges common in undergraduate research.

**Session 92**

*Professional Development*  
Individual Session

Ahwatukee B

**SECOND WAVE CHALLENGES TO IMPROVING INSTRUCTION ACROSS A DISTRICT: PLATEAUS AND THREATS**

Brian R. Lawler, Kennesaw State University  
Abi Leaf, Escondido Union High School District

We present a theory for changing instructional practices and beliefs that after six years, resulted in detracked course pathways and discourse-rich classrooms in one high-school district. However, a plateau in teacher growth and new leadership present threats to sustaining improvement.

**Session 93**

*Teaching and Learning with Technology*  
Individual Session

Laveen A

**THE ROLE OF VOICE THREAD IN SUPPORTING EFFECTIVE MATHEMATICAL DISCUSSIONS ONLINE**

Chrystal Dean, Appalachian State University  
Tracy J. Goodson-Espy, Appalachian State University

This session describes backward design for teaching online (BD+) (Author, year); and examines use of Voice Thread to support mathematical discussions in a hybrid mathematics methods course for elementary teachers, and support statistical discussions within a doctoral research methods course.

**Session 94**

*Mathematics Pedagogy*  
Individual Session

Laveen B

**LEARNING TO PLAN INSTRUCTIONAL UNITS: REEXAMINING THE GRAIN-SIZE IN TEACHER PREPARATION**

Lorraine M. Males, University of Nebraska, Lincoln  
Orly Buchbinder, University of New Hampshire

Understanding by Design framework was used in two secondary methods courses in two universities to engage PSTs (n=64) in lesson and unit planning. Preliminary results suggest PSTs' increased confidence and understanding of big ideas, learning goals, and learning progressions.

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Session 95

Estrella

## **BRIEF REPORT SESSION: DIFFERENTIATION**

### **OPPORTUNITIES TO LEARN ABOUT DIFFERENTIATION: A CASE OF ONE-ON-ONE COACHING**

Eythokia Stephanie Saclarides, The University of Alabama  
Kristin E. Harbour, University of South Carolina

We explore one coach-teacher dyad's conversational learning opportunities about differentiation during a co-teaching cycle. Results indicate that even for this experienced teacher and coach who were committed to differentiating instruction, there are certain limitations that need to be overcome.

### **PLANNING FOR DIFFERENTIATION OF INSTRUCTION AS A CORE PRACTICE SUPPORTING AMBITIOUS INSTRUCTION**

Leigh A. van den Kieboom, Marquette University

This session will engage participants in conversations about planning for differentiation of instruction as a core practice supporting ambitious instruction. Research related to strategies preservice teachers used and the quality of preservice teacher planning for differentiation will be presented.

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Session 96

Maryvale A

*Teaching and Learning with Technology*  
Individual Session

### **PRESERVICE TEACHERS' VIEWS OF MATHEMATICS INSTRUCTION MEDIATED BY IPADS**

Angela T. Barlow, University of Central Arkansas  
Victoria Groves-Scott, University of Central Arkansas

Presenters will share the design of six video cases and the mobile-learning framework on which they were based. Preservice teachers' ideas surrounding the video cases will offer insight into preparing teachers to teach with technology.

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Session 97

Maryvale B

*Equity, Social Justice, and Mathematics Teacher Education*  
Discussion Session

### **TOWARD AN ANTIRACIST MATHEMATICS TEACHER EDUCATOR PRACTICE: A REFLECTIVE RESOURCE**

Brent Jackson, Michigan State University  
Molade Osibodu, Michigan State University  
Sunghwan Byun, Michigan State University  
Beth Herbel Eisenmann, Michigan State University

We share a reflective resource designed for use by mathematics teacher educators (MTEs) as they seek to move toward an antiracist pedagogy. The resource considers four domains of power (disciplinary, institutional, cultural, and intrapersonal) in which MTEs can practice antiracism.

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Session 98

Encanto A

*Individual Session*

### **LEARN HOW TO INCORPORATE FREE PK-5 MATH CURRICULUM INTO YOUR COURSE**

Pamela Harris, Arizona State University

The content of Bridges in Mathematics PK-5 from The Math Learning Center is available free to schools of education. Join Bridges author and university instructor Pam Harris to learn how this program can enhance your courses and field experiences for prospective and preservice teachers.

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Session 99

Phoenix A

*Practice-Based Experiences for Prospective Teachers*  
Individual Session

### **DEVELOPING PROSPECTIVE TEACHERS' ABILITY TO ENGAGE CHILDREN IN ARGUMENT IN AN ELEMENTARY METHODS COURSE**

Kate Kline, Western Michigan University

We share practice-based activities along with a clinical experience from an elementary methods course used to develop prospective teachers' abilities to facilitate productive argumentation with children. How the clinical experience was linked to class activities will be highlighted.

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Session 100

Phoenix B

*Mathematics Education Policy and Program Issues*  
Individual Session

### **ENGAGING ALUMNI: LINKING LONGITUDINAL RESEARCH TO PROGRAM EVALUATION AND INNOVATION**

Suzanne R. Harper, Miami University  
Dana C. Cox, Miami University

We will focus on program evaluation and longitudinal research. Through the lens of a recent study on the impact of early-career experiences on beliefs about teaching with technology, we explore the obstacles to, methodologies, and limitations of conducting longitudinal research.

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Session 101

Phoenix E

*Mathematics Pedagogy*  
Discussion Session

### **BEGINNING TEACHERS' AMBITIOUS INSTRUCTION: PROMISING PRACTICES AND PLACES TO GROW**

Jillian M. Cavanna, University of Hartford  
Tutita M. Casa, University of Connecticut  
Holly Henderson Pinter, Western Carolina University

What is ambitious mathematics instruction for first-year teachers? In this session we share findings from video analyses of promising practices and challenges for beginning teachers. Participants will discuss ways to support their preservice teachers to develop future ambitious practices.

**Session 102***Professional Development  
Symposium*

Desert Sky

**SCALING PROFESSIONAL DEVELOPMENT PROGRAMS:  
TRANSITIONING FROM FACE-TO-FACE TO ONLINE  
ENVIRONMENTS**

Paola Sztajn, North Carolina State University  
 Cynthia D. Carson, University of Rochester  
 Angela Knotts, WestEd  
 Cathy E. Carroll, WestEd  
 Stephanie Martin, University of Rochester  
 Reema Alnizami, North Carolina State University  
 Nanette Seago, WestEd

Three face-to-face professional development projects that have shown significant positive impact on teachers discuss their work and design decisions in transitioning into online environments. One project has moved to asynchronous, one to synchronous, and one to hybrid online and face-to-face model.

**Session 103***Mathematics Pedagogy  
Symposium*

Cave Creek

**INVESTIGATIONS INTO CONNECTIONS BETWEEN  
TEACHERS' PROFESSIONAL NOTICING AND TEACHERS'  
COGNITIVE RESOURCES: LOOKING BACK AND MOVING  
FORWARD**

Raymond LaRochelle, University of Delaware  
 Lara Dick, Bucknell University  
 Lisa Skultety, University of Central Arkansas  
 Jonathan Thomas, University of Kentucky

Professional noticing is an important but challenging expertise for teachers to develop. One way to better understand its development is by understanding what cognitive resources teachers utilize when "professionally noticing" a student's work, which is the goal of this symposium.

**Session 104***Mathematics Education Policy and Program Issues  
Symposium*

Ahwatukee A

**QUANTITATIVE RESEARCH INSTRUMENTS RELEVANT TO  
MATHEMATICS TEACHER EDUCATORS**

Erin Elizabeth Krupa, North Carolina State University  
 Jonathan David Bostic, Bowling Green State University  
 Laurie Cavey, Boise State University  
 Leigh Harrell-Williams, University of Memphis  
 Margret Hjalmarson, George Mason University  
 Temple A. Walkowiak, North Carolina State University

We will share five instruments developed for use by MTEs that focus on various outcomes related to the teaching and learning of mathematics. We will discuss the development and validation of the instruments and ways to inform MTEs' work.

**Session 105***Mathematics Content and Curriculum  
Symposium*

Ahwatukee B

**FRAMING AND ASSESSING MATHEMATICAL KNOWLEDGE  
FOR TEACHING PROOF**

Orly Buchbinder, University of New Hampshire  
 Kristin Lesseig, Washington State University, Vancouver  
 Michelle Cirillo, University of Delaware  
 Alice Hempel, University of New Hampshire

We present, compare and contrast three frameworks for Mathematical Knowledge for Teaching Proof (MKT-P). We will share measurement tools and data of secondary pre- and inservice teachers' MKT-P and discuss affordances and challenges of measuring this specialized teacher knowledge.

**Session 106***Development of Mathematics Teacher Educators  
Symposium*

Laveen A

**LEVERAGING DIVERSE TOOLS TO MEASURE  
COMPONENTS OF MATHEMATICALLY PRODUCTIVE  
CLASSROOMS**

Erica G. Litke, University of Delaware  
 Eva Thanheiser, Portland State University  
 Ruth M. Heaton, Teachers Development Group  
 Daniel Lee Reinholz, San Diego State University

We apply three observation tools to one focal lesson, considering what information they provide about mathematics teaching. We note how each contributes to understanding instruction and consider the relationship between goals, the information provided, and use by mathematics teacher educators.

**Session 107***Collaborations and Partnerships  
Symposium*

Laveen B

**BRINGING TEACHER EDUCATION OUTDOORS**

Tracy Weston, Middlebury College  
 Katherine Baker, Elon University

Teaching outdoors with nature-based pedagogies facilitates STEM literacy and environmental mindedness. We will present examples of supporting prospective and practicing teachers' outdoor teaching. Participants will discuss opportunities and challenges, and generate action steps to begin or improve outdoor teacher education.

**Session 108***AMTE 2020 NTLI Award*

South Mountain

**LEVERAGING COMMUNITY FUNDS OF KNOWLEDGE TO  
TEACH MATHEMATICS WITH TECHNOLOGY**

Frances K. Harper, University of Tennessee, Knoxville  
 Nicholas Kim, University of Tennessee, Knoxville

This session explores how prospective elementary teachers learn to leverage both technological tools and community funds of knowledge for equitable mathematics learning. Session participants engage with prospective teachers' design, implementation, and reflection of STEM activities situated within students' local community.

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**Session 109****Estrella***Equity, Social Justice, and Mathematics Teacher Education Symposium***A MATHEMATICS SELECTIVE ALTERNATIVE TEACHER CERTIFICATION PROGRAM (ATCP) FOR URBAN SCHOOLS: TRAJECTORIES, PREPARATION AND CONSEQUENCES**

Laurel Cooley, Brooklyn College, CUNY

Andrew Brantlinger, University of Maryland

Alicia Lochard, University of Pennsylvania

Deena Khalil, Howard University

Erika C. Bullock, University of Wisconsin, Madison

We present quantitative (three surveys of ~620 ATCP math teachers) and qualitative (nine case studies) data from a ten-year study that examines interactions that predict teacher retention, illustrated with in-class observations and in-depth interviews of nine ATCP mathematics teachers.

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**Session 110****Maryvale A***Professional Development Symposium***NEW DIRECTIONS FOR VIDEO-BASED PEDAGOGIES TO ENHANCE TEACHER NOTICING**

Elizabeth A. van Es, University of California, Irvine

Tracy Dobie, University of Utah

Presenters share how video has been situated in professional development to gain insight into and support teachers' noticing practices. We consider issues related to video capture and discuss variations in clip features for different uses of video.

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**Session 111****Maryvale B***Committee Meetings***STRATEGIES FOR SUPPORTING TECHNOLOGY IN MATHEMATICS TEACHER EDUCATION**

AMTE Technology Committee

In this session, the AMTE Technology Committee will address multiple topics relating to technology and mathematics teacher educators including online teaching, coding bots, digital equity, and an opportunity for members to exchange their own ideas about technology integration in their practice. In addition to an overview of challenges and topics for each of the strands, participants will have an opportunity to engage more deeply with topics of their choosing during breakouts within the session.

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**Session 112****Encanto A***Equity, Social Justice, and Mathematics Teacher Education Discussion Session***NATIONAL SCIENCE FOUNDATION PROPOSALS FOR EQUITY, DIVERSITY AND INCLUSION IN MATHEMATICS TEACHER EDUCATION**

Sandra Richardson, National Science Foundation

This session will allow attendees to gain insight into the policies and research considerations of NSF in supporting research on equity, diversity, and inclusion in mathematics teacher education.

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**Session 113****Encanto B***Committee Meetings***PUBLISHING YOUR SCHOLARLY WORK IN AN AMTE PUBLICATION: OPPORTUNITIES EXPLORED AND QUESTIONS ANSWERED**

AMTE Publications Review Committee

This session includes editors from AMTE's publications: Mathematics Teacher Educator, Contemporary Issues in Technology and Teacher Education–Math, Connections, and book series. Focus will be on clarification of expectations, differences among venues, and breakout time for individual questions and feedback.

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**Session 114****Phoenix A***Mathematics Content and Curriculum Symposium***MATHEMATICAL MODELING IN K-12 MATHEMATICS TEACHER PREPARATION**

Julia Aguirre, University of Washington, Tacoma

Erin E. Turner, The University of Arizona

In this multifaceted symposium, four mathematics teacher educators discuss concrete strategies and theoretical frameworks for integrating mathematical modeling in methods and content courses for k-12 teachers. Participants will increase their understanding of how modeling contributes to equitable mathematics instruction.

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**Session 115****Phoenix B***Committee Meetings***I AM NEW TO MATHEMATICS TEACHER EDUCATION: REALITIES OF TEACHING, SCHOLARSHIP, AND SERVICE**

AMTE Professional Development Committee

This session is designed to provide opportunity for novice mathematics teacher educators to interact with experienced mathematics teacher educators. The roundtable structure of the session allows small groups to discuss topics of interest around research, teaching and service.

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**Session 116****Phoenix E***Mathematics Content and Curriculum Symposium***TASKS FOR TEACHERS: APPROACHES TO THE DESIGN OF TASKS FOR PRESERVICE AND INSERVICE LEARNERS**

Chandra Orrill, University of Massachusetts, Dartmouth

Dana Olanoff, Widener University

Melissa Boston, Duquesne University

Rachael E. Brown, Pennsylvania State University, Abington

Jennifer M. Tobias, Illinois State University

Neet Priya Bajwa, Illinois State University

Eva Thanheiser, Portland State University

Rachael M. Welder, Texas A&amp;M University

Amber Grace Candela, University of Missouri, St. Louis

How can we create mathematical experiences that engage preservice or inservice teachers to develop new understandings about mathematics they may already know? In this session, we look across three existing efforts to design such tasks.



**LUNCH**

AMTE provides a buffet lunch in Phoenix C. Please join your colleagues for lunch and good conversation in advance of the Poster Session and other afternoon sessions.

**POSTER SESSION WILL BE LOCATED IN PHOENIX D IMMEDIATELY FOLLOWING LUNCH.**

**PHOENIX C****Session 117****Phoenix D****POSTER SESSION****A1. AN INTEGRATED, IMMERSIVE SUMMER PROGRAM IN MATHEMATICS PEDAGOGY FOR UNDERGRADUATES**

Charles Steinhorn, Vassar College

Victor Donnay, Bryn Mawr College

Ellyn Rose Goldberg, The University of Texas, Austin

The Teaching Experiences for Undergraduates (TEU) Program is an innovative summer program for undergraduate STEM majors integrating a STEM pedagogy course and teaching practicum. We describe TEU, present evaluation and research findings, and discuss TEU's potential as a scalable model.

**A2. CHANGING THE MATHEMATICS CURRICULAR NARRATIVE TO REFLECT TRANSGENDER AND GENDER NON-CONFORMING STUDENTS' IDENTITIES AND EXPERIENCES**

Joseph Antonides, The Ohio State University

Our goal is to share practical recommendations for teachers and teacher educators based on findings of current research on gender-complex education: that is, education acknowledging and valorizing the existence and experiences of transgender and gender non-conforming students.

**A3. ENHANCING PROSPECTIVE TEACHERS' EXPERIENCES REGARDING THE PROGRESSION & COHERENCE OF TOPICS IN MATHEMATICS EDUCATION CONTENT COURSES**

Shahabeddin Abbaspour Tazehkand, University of Central Florida

The focus is on the role of mathematics content classes in teacher preparation programs on prospective mathematics teachers experiences across a progression of mathematical topics, ways these classes address the coherence of mathematical topics and such experiences impact the PSTs impressions.

**A4. EQUITABLE MATHEMATICS CLASSROOM DISCOURSE**

Liza Bondurant, Delta State University

This poster will focus on lessons learned from a self-study on equitable mathematics classroom discourse. The background, purpose, methodology, and findings will be shared. Transformations in the author's goals, definition of equity, and practice will be presented.

**A5. EQUITY ISSUES IN ESTABLISHING SOCIOMATHEMATICAL NORMS OF MATHEMATICAL LANGUAGE**

Hochieh Lin, The Ohio State University

This qualitative study investigated equity issues that emerge as a class is establishing sociomathematical norms of mathematical language. The findings highlighted how a teacher attended to students' unique identities and dealt with their questions to achieve equitable teaching practices.

**A6. EXAMINING PRESERVICE TEACHERS' THEORIES OF INTELLIGENCE RELATED TO MATHEMATICS: IMPLICATIONS FOR EQUITY**

Melissa Warner Hale, Michigan State University

This session examines findings about preservice teachers' beliefs about intelligence, in relationship to their mathematics experiences and backgrounds. Preservice teachers' beliefs about intelligence are more nuanced than indicated by survey measures of growth and fixed theories of intelligence.

**A7. EXPLORING APPROACHES TO SUPPORT EQUITABLE MATHEMATICS INSTRUCTION**

Brian Bowen, West Chester University

This exploratory study examines the perceptions of and practices of k-8 teachers and administrators related to supporting an equitable mathematics classroom.

## **A8. FROM KINDERGARTEN TO COLLEGE: CONNECTING FIELDWORK AND METHODS CLASSES IN TEACHING MATHEMATICS**

Lakesia L. Dupree, University of South Florida

This poster will illustrate a contextual based kindergarten mathematics lesson created by a teacher candidate that was subsequently enacted in a mathematics methods classroom. It will highlight the lessons learned about the development of teacher candidates' mathematical equitable pedagogical practices.

## **B9. INTEGRATING CHILDREN'S LITERATURE IN ELEMENTARY MATH METHODS: FOSTERING UNDERSTANDINGS AND CONNECTIONS**

Dittika Gupta, Midwestern State University

This poster shares results and implications of a qualitative research study examining change in attitudes and perceptions of preservice teachers towards integrating children's literature in elementary mathematics methods. Intervention used provides an integration model for developing connections for preservice teachers.

## **B10. INTRODUCING TEACHER CANDIDATES TO A PROFESSIONAL NETWORK: DIVERSE CONFERENCE EXPERIENCES**

Katherine Ariemma Marin, Stonehill College

Sarah A. Roller, The University of Alabama in Huntsville

We will share how we engaged PSTs with conferences during coursework, including our virtual conference assignment and data evaluating the conference experience for PSTs. Results indicate conference experiences influenced PSTs' thinking about attending conferences and joining professional organizations.

## **B11. LAUNCH REHEARSALS AS A PLANNING TOOL IN SECONDARY MATHEMATICS TEACHER PREPARATION**

Rob Matyska, Indiana University

This study targets one approximation of practice in preservice teacher education, the rehearsal—a robust pedagogy supporting novice teacher learning and practice. This poster presents findings from a semester-long methods block taken by undergraduate students in an initial-licensure program.

## **B12. LEARN ABOUT THE AMTE STAR PROGRAM**

Keith Rigby Leatham, Brigham Young University

If you are a doctoral student or in your first year of a tenure track position, come learn about the AMTE Service, Teaching, and Research (STaR) program. STaR is an early-career induction program for faculty in the first or second year of their position.

## **B13. MAKING SENSE OF MATHEMATICAL ARGUMENTATION IN THE CONTEXT OF ELEMENTARY SCHOOL MATHEMATICS: PRE-SERVICE TEACHERS' INTERPRETATIONS**

Marta T. Magiera, Marquette University

Hyejin Park, Marquette University

We discuss how elementary pre-service teachers make sense of mathematical argumentation. We share how they define mathematical argumentation and how they make meanings of mathematical argumentation as a pedagogical tool in teaching elementary school mathematics.

## **B14. MEDIATED FIELD EXPERIENCE STRUCTURES FOR DUAL EARLY CHILDHOOD AND SPECIAL EDUCATION MAJORS**

Sararose Lynch, Westminster College

This poster will share a variety of structures for Mediated Field Experiences (MFEs) in both mathematics methods and special education courses for dual majors. Research, grounded in AMTE's Standards, on pre-service teachers' experiences and instructional decisions will be shared.

## **B15. PRESERVICE TEACHERS' EXPERIENCES WITH MATHEMATICAL MODELING ACTIVITIES**

Young Rae Kim, Texas A&M University, San Antonio

Hartono Tjoe, Pennsylvania State University, Berks

The purpose of this study is to investigate preservice teachers' experiences in modeling activities. We are interested in examining the extent to which model-eliciting activities might facilitate transfer knowledge from mathematics content knowledge to mathematics pedagogical and instructional practice knowledge.

## **B16. PRESERVICE TEACHERS' SOLVING OF AN OPEN-ENDED TRIGONOMETRY PROBLEM**

Kristi R. Martin, North Carolina State University

Research shows trigonometry is difficult for preservice teachers. This research examines how seven preservice teachers solve a single open-ended trigonometry problem.

## **C17. PROSPECTIVE TEACHERS' BELIEFS AND MATHEMATICAL KNOWLEDGE FOR TEACHING**

Nesrin Sahin, University of Central Arkansas

This longitudinal study investigates the changes in prospective teachers (PTs) beliefs and mathematical knowledge for teaching (MKT) as they take three math content/methods courses during their teacher education program as well as the relationship between PTs' beliefs and MKT

## **C18. REIMAGINING PARTNERSHIPS WITH SCHOOL DISTRICTS: TEACHER EDUCATORS' ROLES IN SUPPORTING AMBITIOUS AND EQUITABLE MATHEMATICS TEACHING**

Courtney Flessner, Indiana University

Ryan Flessner, Butler University

Ambitious and equitable mathematics teaching requires buy-in at the classroom, school, and district level. This poster highlights our partnership with one school district's Mathematics Leadership Team as they collaborated to create a district implementation plan to improve elementary mathematics instruction.

## **C19. TEACHER CANDIDATES' ADAPTIVE EXPERTISE IN MATHEMATICS TEACHING AS DEMONSTRATED IN TEACHER CANDIDATE ASSESSMENT OF PERFORMANCE**

Diana Sherman, Saint Anselm College

Case study analysis of 31 teacher candidates' work on a comprehensive performance assessment of learning to teach elementary mathematics reveals the positive impact of specific interventions (course sessions and materials) on candidates' development of the practice of eliciting student thinking.

## **C20. TEACHING INQUIRY-BASED MATHEMATICS: TOWARD A LEARNING TRAJECTORY TO GUIDE MATHEMATICS TEACHER-EDUCATOR PRACTICE IN THE METHODS COURSE**

Barbara Kinach, Arizona State University

The intent of this project was to develop a model learning trajectory to guide mathematics teacher educator (MTE) practice related to the development of pre-service teachers' inquiry-based mathematics teaching practice in the mathematics methods course.

## **C21. THE CONCEPTUAL HEART OF A LESSON: THE IMPACT OF TEACHER PRACTICES IN AN ELEMENTARY ALGEBRA LESSON**

Ingrid G. Ristroph, The University of Texas, Austin  
Karisma Morton, University of North Texas

This study is an examination of how teacher practices support their students' conceptual understanding. An analysis of the teacher's use of visualization, productive struggle, and explicit attention to concept is made for 19 observations of the same early algebra lesson.

## **C22. USING MIXED-REALITY SIMULATIONS WITH PRE-SERVICE TEACHERS IN A MATHEMATICS METHODS COURSE: PRELIMINARY STUDY OF PERCEPTIONS.**

Jair J. Aguilar, The University of Texas, Rio Grande Valley  
James Anthony Telese, The University of Texas, Rio Grande Valley

The Poster presented here depict preliminary results of an ongoing study of perceptions of pre-service elementary mathematics teachers when exposed to the use of Mixed-Reality Simulations in a mathematics methods course.

## **C23. VISUALIZATION AND VERBALIZATION IN GROUP COMMUNICATION DURING A VECTOR CALCULUS TASK**

Tasnim Alshuli, The University of Arizona  
Marcy B. Wood, The University of Arizona

This poster explores how students' mathematical talk shifted as they made sense of a task involving a gradient field. As the students discussed what mathematical objects told them (rather than what they saw), their talk became more mathematically desirable.

## OVERVIEW OF FRIDAY AFTERNOON, FEBRUARY 7, 2020

	2:15 PM - 3:00 PM	3:30 PM - 4:30 PM
<b>Desert Sky</b>	118. <i>Designing Statistics Preparation for Preservice Elementary Teachers</i> - Naresh, Prasad, & Vallines Mira	133. <i>Brief Report Session: Teacher Noticing</i> - Fisher, Thomas, & Schack; Rassi & Barker; White & Lawler
<b>Cave Creek</b>	119. <i>Brief Report Session: Online Professional Development</i> - Gordon & Dula; Dobie	134. <i>Supporting Prospective Teachers' Conceptions of Fractions as Measures in an Online Environment</i> - MacDonald, Moss, Boyce, & Bertolone-Smith
<b>Ahwatukee A</b>	120. <i>Brief Report Session: Lesson Study</i> - Kasten & Noblitt; Koester	135. <i>Brief Report Session: Number Talks</i> - Wohlhuter & Swarthout; Kirschner & Baker
<b>Ahwatukee B</b>	121. <i>Investigating Teachers' Practice of Anticipating</i> - Wilson & Wonsavage	136. <i>Professional Noticing of Coaches and Teachers using Video Annotations</i> - Amador, Gillespie, & Carson
<b>Laveen A</b>	122. <i>Statistics Topics to Be Taught by K-12 Teachers so Students Are Prepared for College</i> - Kozak	137. <i>Secondary Math Program Design Effects on edTPA/Praxis2 Exams - A Multi-year Longitudinal Study</i> - Zolkowski
<b>Laveen B</b>	123. <i>Using Regular and Constructive Feedback to Support Teacher Candidate Learning and Growth</i> - Kulow & Rigelman	138. <i>Examining Instructional Activities Used in Practice-Embedded Learning Experiences that Support Student and Educator Learning</i> - Knapp & Gibbons
<b>South Mountain</b>	124. <i>Brief Report Session: State Standards and Teacher Preparation</i> - McMahon & Krebs; Grant & Kline	139. <i>Addressing the SPMTs: Critical conversations about preparing mathematics teachers to utilize technology in their instruction</i> - McCulloch, Leatham, Bailey, & Reed
<b>Estrella</b>	125. <i>Catalyzing Change: Initiating Critical Conversations in Mathematics Teaching and Learning</i> - Berry	140. <i>Using Curriculum to Move Teachers' Curricular Reasoning from Sequencing to Learning Trajectories</i> - Teuscher, Dingman, & Olson
<b>Maryvale A</b>	126. <i>"A Coming of Age Story for the Diagonals": Mathematics Teacher Learning via Collaborative Lesson Design</i> - Riling & Starks	141. <i>Brief Report Session: Equity and Social Justice in Mathematics Teacher Education 2</i> - Neil & Hummel; Sanchez, Edwards, & Glassmeyer; Warburton
<b>Maryvale B</b>	127. <i>Using Self-Directed Learning to Engage with Culture and Funds of Knowledge</i> - Molitoris Miller	142. <i>Examining Prospective Secondary Mathematics Teachers' Noticing on Two Tasks</i> - Chandler
<b>Encanto A</b>	128. <i>Developing Pre-Service Teachers' Understanding of Mathematical Mindsets: Influences of an Online Gamification Tool</i> - Layton	143. <i>Developing Mathematics Teachers' Political Knowledge for Teaching: The Remix</i> - Gutierrez, Kokka, & Myers
<b>Encanto B</b>	129. <i>Which is the Tool? Elementary Teacher Candidates' Analysis of Instruction in STEM Experiences</i> - Burton	144. <i>Real-Time Coaching During Secondary PSTs' Teaching Episodes: The Practices of Mathematics Teacher Educators</i> - Arbaugh, Cirillo, LaRochelle, & Do
<b>Phoenix A</b>	130. <i>LGBTQQ+ Responsive Mathematics Teacher Education: Comparing Experiences Across Contexts</i> - Dubbs, Koestler, & Whipple	145. <i>Implementing a High-cognitive Demand Task: Prospective Teachers' Generated Task Dialogues</i> - Foster
<b>Phoenix B</b>	131. <i>Supporting Teachers' Understanding of Learning Trajectories with Data-Driven PD</i> - Shah	146. <i>Preservice Teachers' Design of Technology-Enhanced Statistical Tasks</i> - Hudson, Casey, Barker, & Harrison
<b>Phoenix D</b>		147. <i>Achieving "Strategic Outcomes" through Discrete Mathematics: Developing Content Knowledge, Designing Curriculum, and Addressing Equity Issues</i> - Gatza, Tillema, & Burch
<b>Phoenix E</b>	132. <i>Examining Preservice Teachers Beginning Practices of Integrating the Standards for Mathematical Practices with Content Standards</i> - Gichobi	148. <i>A Community-engaged Approach to advance Teacher Noticing for Equity</i> - van Es

**Session 118**

*Mathematics Content and Curriculum  
Individual Session*

Desert Sky

**DESIGNING STATISTICS PREPARATION FOR PRESERVICE ELEMENTARY TEACHERS**

Nirmala Naresh, University of North Texas  
Priya Vinata Prasad, The University of Texas, San Antonio  
Raquel Vallines Mira, The University of Texas, San Antonio

We share key aspects of a statistics project for elementary preservice teachers designed using the Continuous Improvement iterative task design framework. We engaged PSTs in the four-step statistical problem-solving process using data from the U.S. Census at School project.

**Session 119**

Cave Creek

**BRIEF REPORT SESSION: ONLINE PROFESSIONAL DEVELOPMENT****MATHEMATICS IMMERSION PROFESSIONAL DEVELOPMENT IN AN ONLINE CLASSROOM WITH IN-PERSON SCHOOL GROUPS: RESEARCH RESULTS**

Evelyn M. Gordon, Horizon Research, Inc.  
Jessica Dula, Horizon Research, Inc.

Teacher groups engaged in synchronous online sessions designed to enact mathematics immersion. Findings from quasi-experimental research address the success of enactments in promoting immersion and impacts on teachers' mathematical habits of mind, beliefs about teaching and learning, and classroom practice.

**SUPPORTING PRODUCTIVE TEACHER DISCOURSE IN ONLINE PROFESSIONAL DEVELOPMENT**

Tracy Dobie, University of Utah

Presenters share analyses of teachers' conversation patterns in online professional development courses. We explore how using the sentence stems "I notice" and "I wonder" shifted discourse, considering affordances of stems for developing productive discourse norms in online teacher learning communities.

**Session 120**

Ahwatukee A

**BRIEF REPORT SESSION: LESSON STUDY****PROSPECTIVE TEACHERS LEARNING TO USE REAL-WORLD CONTEXTS IN A LESSON STUDY**

Sarah Kasten, Northern Kentucky University  
Bethany Noblitt, Northern Kentucky University

To understand the struggles of PTs attempting to incorporate real-world contexts into lessons, we conducted a case study of a two-cycle lesson study in a middle grades mathematics methods course. The result was a classification of ways PTs use contexts.

**WHAT DO SECONDARY MATHEMATICS PRESERVICE TEACHERS LEARN DURING LESSON STUDY CYCLES?**

Mark Koester, Metropolitan State University of Denver

We will share and discuss our methodology and research findings of a study with eight secondary mathematics preservice teachers who participated in Lesson Study during their Fall 2018 semester of student teaching.

**Session 121**

*Mathematics Pedagogy  
Individual Session*

Ahwatukee B

**INVESTIGATING TEACHERS' PRACTICE OF ANTICIPATING**

Holt Wilson, University of North Carolina, Greensboro  
F. Paul Wonsavage, University of North Carolina, Greensboro

In this session, we share progress in developing a coding scheme for investigating secondary mathematics teachers' practices of anticipating students' mathematical approaches to cognitively demanding tasks in multiple domains of mathematics.

**Session 122**

*AMATYC President Exchange Session*

Laveen A

**STATISTICS TOPICS TO BE TAUGHT BY K-12 TEACHERS SO STUDENTS ARE PREPARED FOR COLLEGE**

Kathryn Kozak, AMATYC

Statistics is a growing field in today's workforce. Thus, it is necessary to introduce statistics in K-12. This presentation will describe the skills teachers need to introduce basic statistics in a K-12 environment and will include some useful technology.

**Session 123**

*Practice-Based Experiences for Prospective Teachers  
Individual Session*

Laveen B

**USING REGULAR AND CONSTRUCTIVE FEEDBACK TO SUPPORT TEACHER CANDIDATE LEARNING AND GROWTH**

Torrey Kulow, Portland State University  
Nicole Rigelman, Portland State University

Participants discuss the supports mentor teachers and university supervisors need to provide "regular" and "constructive" feedback to teacher candidates through learning about a recent study on mentor teacher feedback and a Field Evaluation Tool used in one teacher education program.

Session 124

South Mountain

## **BRIEF REPORT SESSION: STATE STANDARDS AND TEACHER PREPARATION**

### **CAN STATE MATHEMATICS TEACHER PREPARATION STANDARDS DRIVE REFORM? ONE STATE'S EXPERIENCES IN DEVELOPING CUTTING EDGE STANDARDS**

Darcy McMahon, Michigan Department of Education  
Angela Krebs, University of Michigan, Dearborn

Recently, Michigan developed new Mathematics Teacher Preparation Standards with the AMTE's SPTM as a primary source. They are integrated across three areas: pedagogy, content, and dispositions. This session will share the development process and the potential impact for reform.

### **REDESIGNING AN ELEMENTARY EDUCATION PROGRAM IN RESPONSE TO STATE STANDARDS**

Theresa Jean Grant, Western Michigan University  
Kate Kline, Western Michigan University

We will discuss the ways in which we are using new state standards as an opportunity to create a new sequence of courses for prospective elementary teachers. These courses will integrate both practice-based experiences and scaffolded clinical experiences throughout.

Session 125

Estrella

*NCTM President Exchange Session*

### **CATALYZING CHANGE: INITIATING CRITICAL CONVERSATIONS IN MATHEMATICS TEACHING AND LEARNING**

Robert Berry, National Council of Teachers of Mathematics & University of Virginia

The National Council of Teachers of Mathematics formed three writing teams at the early childhood/elementary, middle school, and high school levels with the intent to initiate the critical conversations needed to address issues in school mathematics. The Catalyzing Change series focuses on recommendations in school mathematics with the purpose of initiating critical conversations for improving mathematics teaching and learning in school mathematics. This talk is intended to initiate critical conversations based on the key recommendations from the Catalyzing Change series.

Session 126

Maryvale A

*Collaborations and Partnerships  
Individual Session*

### **"A COMING OF AGE STORY FOR THE DIAGONALS": MATHEMATICS TEACHER LEARNING VIA COLLABORATIVE LESSON DESIGN**

Meghan Riling, Boston University  
Rachel Starks, Boston University

Through describing meetings in which teachers and researchers designed a high school geometry lesson, we explain how both collaboration and the concept of mathematical stories supported practicing teachers' lesson design and opportunity to learn about enacting aesthetically engaging lessons.

Session 127

Maryvale B

*Mathematics Content and Curriculum  
Individual Session*

### **USING SELF-DIRECTED LEARNING TO ENGAGE WITH CULTURE AND FUNDS OF KNOWLEDGE**

Susanna Molitoris Miller, Kennesaw State University

Self-directed learning activities provide opportunities for pre-service teachers to engage with ideas related to their culture and building on their own funds of mathematical knowledge, by exploring ways they and their peers implicitly and explicitly use mathematics in their lives.

Session 128

Encanto A

*Mathematics Pedagogy  
Individual Session*

### **DEVELOPING PRE-SERVICE TEACHERS' UNDERSTANDING OF MATHEMATICAL MINDSETS: INFLUENCES OF AN ONLINE GAMIFICATION TOOL**

Rebecca Doty Layton, University of Tennessee, Knoxville

This session presents findings of a study examining how PSTs' understandings of mathematical mindsets are influenced by using an online gamification tool. Aspects of the online gamification tool that PSTs perceived as benefiting and limiting their learning will be discussed.

Session 129

Encanto B

*Practice-Based Experiences for Prospective Teachers  
Individual Session*

### **WHICH IS THE TOOL? ELEMENTARY TEACHER CANDIDATES' ANALYSIS OF INSTRUCTION IN STEM EXPERIENCES**

Megan Burton, Auburn University

Preservice teachers experience challenges and wonderings when planning STEM lessons with intentional focus on mathematics learning as opposed to being a tool for other content. Explore ways to support preservice teachers' STEM lesson planning that advances student learning in mathematics.

Session 130

Phoenix A

*Equity, Social Justice, and Mathematics Teacher Education  
Individual Session*

### **LGBTQQ+ RESPONSIVE MATHEMATICS TEACHER EDUCATION: COMPARING EXPERIENCES ACROSS CONTEXTS**

Christopher Dubbs, Michigan State University  
Courtney Koestler, Ohio University  
Kyle S. Whipple, University of Wisconsin, Eau Claire

We present a study of prospective teachers reading brief vignettes about LGBTQQ+ people in mathematics education settings, discussing how they might respond, and performing role plays for their peers. We share findings and describe similarities and differences among three institutions.

**Session 131**

*Professional Development  
Individual Session*

**Phoenix B****SUPPORTING TEACHERS' UNDERSTANDING OF LEARNING TRAJECTORIES WITH DATA-DRIVEN PD**

Meetal Shah, North Carolina State University

Come see what we've learned from our partnering teachers about their needs for effective data-driven professional development and support around Learning Trajectories (LTs). You will have an opportunity to analyze sample diagnostic assessment data, test items, and their related LTs.

**Session 132**

*Mathematics Content and Curriculum  
Discussion Session*

**Phoenix E****EXAMINING PRESERVICE TEACHERS BEGINNING PRACTICES OF INTEGRATING THE STANDARDS FOR MATHEMATICAL PRACTICES WITH CONTENT STANDARDS**

Mary N. Gichobi, University of Wisconsin, Green Bay

This session will discuss activities used in an integrated mathematics content and methods course and explicate the extent to which the activities developed PSTs' practices of integrating SMPs and content standards. Please join us for a productive learning opportunity!

**FRIDAY, FEBRUARY 7, 2020****3:00 PM - 3:30 PM****FRIDAY AFTERNOON BREAK**

This is a great time to stretch, network with colleagues, and visit the exhibitors.

**PHOENIX BALLROOM FOYER  
& ENCANTO FOYER**

Session 133

Desert Sky

**BRIEF REPORT SESSION: TEACHER NOTICING****MATHEMATICAL TEACHER DECISIONS: THE ANALYTICAL LENS MATTERS**

Molly Fisher, University of Kentucky  
Jonathan Thomas, University of Kentucky  
Edna O'Brien Schack, Morehead State University

We analyze the deciding component of professional noticing of elementary preservice teachers. In order to gauge whether decisions are productive, the SMP's and MTP's are used as a new coding guide and results are compared to previous research in this area.

**OPPORTUNITIES TO NOTICE AND TEACHER NOTICING**

Darl Rassi, Olivet Nazarene University  
David D. Barker, Illinois State University

Teacher noticing of student mathematical thinking is an essential, yet complex, phenomenon. This study compared secondary pre-service teachers' reports of their noticing to their actual lesson videos to identify three types of noticing: actual, dismissed, and phantom.

**PRESERVICE TEACHERS' NOTICING OF MIDDLE SCHOOL STUDENTS' MATHEMATICAL STRENGTHS**

Dorothy Y. White, University of Georgia  
Brian R. Lawler, Kennesaw State University

We report our efforts to develop asset-based pedagogical orientations in PSTs. In this session, we describe the ways in which PSTs identify and attend to middle school students' mathematical strengths during the implementation of a group-worthy task.

Session 134

Cave Creek

*Mathematics Content and Curriculum*  
*Individual Session*

**SUPPORTING PROSPECTIVE TEACHERS' CONCEPTIONS OF FRACTIONS AS MEASURES IN AN ONLINE ENVIRONMENT**

Beth L. MacDonald, Utah State University  
Diana L. Moss, Utah State University  
Steven Boyce, Portland State University  
Claudia Marie Bertolone-Smith, California State University, Chico

We present an instructional sequence in an online mathematics methods course for supporting prospective teachers' (PTs) construction of fractions as measures. We explore PTs' fractions reasoning with the goal of informing modifications in the course to support measurement conceptions.

Session 135

Ahwatukee A

**BRIEF REPORT SESSION: NUMBER TALKS****LESSONS LEARNED THROUGH INSTRUCTIONAL USE OF NUMBER TALKS FOR DEVELOPING NUMBER SENSE**

Kay A. Wohlhuter, University of Minnesota, Duluth  
Mary B. Swarthout, Sam Houston State University

Two educators will share the process and research results from their collaborative study that examined the instructional use of Number Talks with preservice teachers across the early childhood to secondary spectrum.

**USING NUMBER TALKS TO EXPLORE PRESERVICE TEACHERS' MATHEMATICAL KNOWLEDGE FOR TEACHING**

Sara Kirschner, George Mason University  
Courtney Baker, George Mason University

We explored the use of number talks in a methods course to probe and extend preservice elementary teachers' knowledge of fractions concepts. We found that number talks revealed PST's misconceptions and allowed them to experience new ways of conceptualizing fractions.

Session 136

Ahwatukee B

*Teaching and Learning with Technology*  
*Individual Session*

**PROFESSIONAL NOTICING OF COACHES AND TEACHERS USING VIDEO ANNOTATIONS**

Julie Amador, University of Idaho  
Ryan Gillespie, University of Idaho  
Cynthia D. Carson, University of Rochester

We will describe our online coaching model that integrates video and annotations and will share research findings about the professional noticing of coaches and teachers. Attendees will engage with video annotations and how the process relates to teacher noticing.

Session 137

Laveen A

*Mathematics Education Policy and Program Issues*  
*Individual Session*

**SECONDARY MATH PROGRAM DESIGN EFFECTS ON EDTPA/PRAxis2 EXAMS - A MULTI-YEAR LONGITUDINAL STUDY**

Jeremy Zelkowsky, The University of Alabama

Empirical findings of a six-year, five-cohort, structural equation modeling path-analysis study of the direct/indirect effect sizes of capstone math courses, sequenced methods courses, and key hallmark assessments on edTPA/Praxis2 exams. Implications for local implementation are shared and discussed.



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**Session 138**

Laveen B

*Professional Development  
Discussion Session***EXAMINING INSTRUCTIONAL ACTIVITIES USED IN PRACTICE-EMBEDDED LEARNING EXPERIENCES THAT SUPPORT STUDENT AND EDUCATOR LEARNING**Melinda Knapp, Oregon State University, Cascades  
Lynsey Gibbons, Boston University

This session will engage teacher educators working with pre-or in-service teachers who aim to design practice-embedded learning experiences that utilize instructional activities. We examine the critical components of IAs that are productive in supporting mathematics teachers' learning and student learning.

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**Session 139**

South Mountain

*Mathematics Education Policy and Program Issues  
Individual Session***ADDRESSING THE SPMTs: CRITICAL CONVERSATIONS ABOUT PREPARING MATHEMATICS TEACHERS TO UTILIZE TECHNOLOGY IN THEIR INSTRUCTION**Allison McCulloch, University of North Carolina, Charlotte  
Keith Rigby Leatham, Brigham Young University  
Nina Gabrielle Bailey, University of North Carolina, Charlotte  
Samuel Douglas Reed, Middle Tennessee State University

We will share the results from a survey focused on how programs are preparing secondary mathematics teachers to teach with technology and use these results to frame a discussion about how our programs are meeting the goals of the SPMTs.

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**Session 140**

Estrella

*Mathematics Content and Curriculum  
Individual Session***USING CURRICULUM TO MOVE TEACHERS' CURRICULAR REASONING FROM SEQUENCING TO LEARNING TRAJECTORIES**Dawn Teuscher, Brigham Young University  
Shannon W. Dingman, University of Arkansas  
Travis Austin Olson, University of Nevada, Las Vegas

Teachers are using more online materials and often modify their existing textbook sequences as they plan and enact lessons. These decisions impact the scope and sequence of the mathematics for students. We will discuss teachers' reasoning for these decisions.

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**Session 141**

Maryvale A

*Equity, Social Justice, and Mathematics Teacher Education***BRIEF REPORT SESSION: EQUITY AND SOCIAL JUSTICE IN MATHEMATICS TEACHER EDUCATION 2****EMBEDDING AN EQUITY STANCE INTO A MATH LEADERSHIP PROGRAM: LESSONS, IMPLICATIONS AND LINGERING QUESTIONS**Bisola Neil, Bank Street College of Education  
Robin Ellen Hummel, Bank Street College of Education

This presentation shares lessons learned from the journey of embedding an equity stance into a math leadership program. Implications of this stance for the recruitment and retention of teachers and leaders of color will be addressed through an engaged discussion.

**SUPPORTING TRADITIONALLY-UNDERSERVED STUDENTS IN MATHEMATICS TEACHER EDUCATION PROGRAMS**Wendy Burlison Sanchez, Kennesaw State University  
Belinda Pickett Edwards, Kennesaw State University  
David Glassmeyer, Kennesaw State University

In this session, participants will learn results of research designed to understand challenges traditionally-underserved students encounter in teacher education programs and factors that support or hinder students' sense of belonging. They will brainstorm ways of supporting their own traditionally-underserved students.

**TENSIONS OF RESPONSIBILITY: PREPARING PRESERVICE MATH TEACHERS TO TEACH FOR SOCIAL JUSTICE**

Trevor Warburton, Utah Valley University

This report analyzes framings of responsibility to understand how (mostly) white preservice MTs are caught by responsibility. These discourses lead teachers to locate responsibility elsewhere or enact SJ problematically. I propose a tension (Gutiérrez, 2009) between taking and sharing responsibility.

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**Session 142**

Maryvale B

*Mathematics Pedagogy  
Individual Session***EXAMINING PROSPECTIVE SECONDARY MATHEMATICS TEACHERS' NOTICING ON TWO TASKS**

Kayla Chandler, East Carolina University

During this session, results from an exploratory multi-case study will be shared where prospective secondary mathematics teachers were asked to engage in noticing by examining artifacts of practice from a paper and pencil task and a technology task.

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**Session 143**

Encanto A

*Equity, Social Justice, and Mathematics Teacher Education  
Individual Session***DEVELOPING MATHEMATICS TEACHERS' POLITICAL KNOWLEDGE FOR TEACHING: THE REMIX**Rochelle Gutierrez, University of Illinois, Urbana-Champaign  
Kari Kokka, University of Pittsburgh  
Marrielle Myers, Kennesaw State University

Preservice teachers need opportunities to critique initiatives and leverage resources to make significant changes in their schools. Two universities expanded the ways they are using "scenarios" to prepare teachers for politics of teaching. Participants will explore findings and experience activities.

**Session 144****Encanto B***Development of Mathematics Teacher Educators  
Individual Session***REAL-TIME COACHING DURING SECONDARY PSTS' TEACHING EPISODES: THE PRACTICES OF MATHEMATICS TEACHER EDUCATORS**Fran Arbaugh, Pennsylvania State University  
Michelle Cirillo, University of Delaware  
Raymond LaRochelle, University of Delaware  
Seonmi Do, Pennsylvania State University

We engaged in real-time coaching during our secondary PSTs' teaching episodes across three institutions. We present findings from a study of our MTE practices and engage participants in discussions of the early field experience model and this type of coaching.

**Session 145****Phoenix A***Practice-Based Experiences for Prospective Teachers  
Individual Session***IMPLEMENTING A HIGH-COGNITIVE DEMAND TASK: PROSPECTIVE TEACHERS' GENERATED TASK DIALOGUES**

Jonathan Foster, University of Georgia

We discuss our use of an approximation of practice called task dialogues to understand how first-semester prospective secondary mathematics students would implement a high-cognitive demand task during small group instruction.

**Session 146****Phoenix B***Teaching and Learning with Technology  
Individual Session***PRESERVICE TEACHERS' DESIGN OF TECHNOLOGY-ENHANCED STATISTICAL TASKS**Rick A. Hudson, University of Southern Indiana  
Stephanie Casey, Eastern Michigan University  
Heather Barker, North Carolina State University  
Taylor Harrison, North Carolina State University

An assignment where preservice teachers designed statistical tasks utilizing the dynamic statistical tool CODAP will be shared. Participants will learn about the assignment's components, examine examples of PSTs' work, and apply and discuss a framework for analyzing statistical tasks.

**Session 147****Phoenix D***Mathematics Content and Curriculum  
Symposium***ACHIEVING "STRATEGIC OUTCOMES" THROUGH DISCRETE MATHEMATICS: DEVELOPING CONTENT KNOWLEDGE, DESIGNING CURRICULUM, AND ADDRESSING EQUITY ISSUES**Andrew Gatzka, Indiana University  
Erik Tillema, Indiana University  
Lori Burch, Indiana University

This symposium uses data from three projects to illustrate benefits of discrete mathematics in secondary curricula and necessary supports for pre- and in-service teachers, building connections between discrete mathematics and other components of curricula as well as broader social phenomena.

**Session 148****Phoenix E***Collaborations and Partnerships  
Individual Session***A COMMUNITY-ENGAGED APPROACH TO ADVANCE TEACHER NOTICING FOR EQUITY**

Elizabeth A. van Es, University of California, Irvine

Presenters will share an overview of a participatory action research approach to collectively develop a framework and professional learning model to support noticing for equity. We will focus on reflective experiences and insights gained from teachers and community members.

**FRIDAY, FEBRUARY 7, 2020****5:00 PM - 6:30 PM****JUDITH JACOBS LECTURE****Research and Mathematics Teacher Education: Triumphs, Trials, and Transitions**

Paola Sztajn, North Carolina State University

In this presentation I share triumphs, trials, and transitions of a career dedicated to connecting research and practice in mathematics teacher education. I consider how lessons learned can impact the work of mathematics teacher educators and teacher education researchers.

**PHOENIX C**

**FRIDAY, FEBRUARY 7, 2020**

**6:30 PM - 7:30 PM**

**A M T E**

**RECEPTION FOR ALL CONFERENCE ATTENDEES**

**PHOENIX D / 3<sup>rd</sup> STREET FOYER**

Please join your colleagues for informal conversation and light refreshments immediately following the Judith Jacobs Lecture.



**SATURDAY, FEBRUARY 8, 2020**

**6:45 AM - 7:45 AM**

**A M T E**

**AMTE BREAKFAST AND AFFILIATE MEETINGS**

**PHOENIX C**

Tables will be designated for AMTE Affiliate groups to meet during Saturday morning's breakfast. For a listing of the AMTE Affiliates and table locations, please see pages 9 and 10 of this program.



## OVERVIEW OF SATURDAY MORNING, FEBRUARY 8, 2020

	8:00 AM - 9:00 AM	9:15 AM - 10:15 AM
<b>Desert Sky</b>	150. <i>Brief Report Session: Beliefs and Ways of Thinking-</i> Sweeny & Nabours; Slavit & Lesseig; Graif	166. <i>Brief Report Session: Mathematical Practices-</i> LaMar; Mortimer; Wood
<b>Cave Creek</b>	151. <i>Letting Go: Cultivating Agency and Authority through Number Talks in the Secondary Mathematics Classroom-</i> Humphreys	167. <i>Sharing our Way out of Isolation-</i> Candela & de Araujo
<b>Ahwatukee A</b>	152. <i>Brief Report Session: Interdisciplinary Teacher Preparation-</i> Reiten; Zonnefeld & Zonnefeld; Ruef & Chavez	168. <i>Brief Report Session: Integrated STEM Instruction-</i> Appelgate, Jackson, & Jurgenson; Jurgenson & Appelgate
<b>Ahwatukee B</b>	153. <i>Preparing Teachers to Teach Statistics and the Role of Heteronormative Critique-</i> Parise Schmidt	169. <i>Three Lenses on Equity for Mathematics Content Teachers-</i> Zavala, Seashore, Simic-Muller, & Felton-Koestler
<b>Laveen A</b>	154. <i>Collaborating for Change: A Longitudinal Professional Development Project for Inclusive Elementary Classrooms-</i> Harbour & Livers	170. <i>Multiplicative Structure: Helping Prospective Elementary Teachers Shed their Dependence on Guess-and-Check Methods-</i> Feldman
<b>Laveen B</b>	155. <i>Brief Report Session: Elementary Teacher Learning and Assessment-</i> O'Kelley; Kurz & Lee; Kerrigan & Ulrich	171. <i>Brief Report Session: Developing Mathematical Knowledge for Teaching-</i> Corven; Ghosh Hajra & Ozturk; Tyminski & Castro Superfine
<b>South Mountain</b>	156. <i>Practicing purposeful questioning: alignment between secondary prospective teachers' planned and enacted questions during early field experiences-</i> Orr, Bieda, Hale, & Voogt	172. <i>Promoting Curiosity and Wonder Through Family Mathematics and Science Nights-</i> Aqazade, Bofferding, Richardson, & Simpson
<b>Estrella</b>	157. <i>Incorporating Immersive 360 Video in Mathematics Teacher Education: Potential and Challenges-</i> Kosko, Weston, & Amador	173. <i>Leveraging the edTPA and Standards for Preparing Teachers of Mathematics: Supporting PSTs' Development of Practice-</i> Nitta, Moscatelli, & Roth McDuffie
<b>Maryvale A</b>	158. <i>Developing Equity Literacy in the Statistical Education of Teachers-</i> Casey & Wilson	174. <i>Tracking Preservice Teachers' Gesturing on Riemann Sum Tasks-</i> LaCroix
<b>Maryvale B</b>	159. <i>Grace in Learning: A Necessary Condition of Equitable Practices in the Mathematics Classroom-</i> Amidon, Marshall, & Smith	175. <i>Collaborating Nationally and Acting Locally to Enhance Clinical Experiences Using Coteaching Strategies-</i> Stone, Oloff-Lewis, Castro-Minnehan, Junor Clarke, & Cayton
<b>Encanto A</b>	160. <i>Why Do You Ask...?-</i> Hardamon	176. <i>Middle and Secondary Prospective Teachers' Motivations to Implement Social Justice Mathematics Lessons-</i> Id-Deen, Baldinger, Sun, & Waller
<b>Encanto B</b>	161. <i>Re-Envisioning Mathematics Education Programs to Build Equitable Teaching Practices-</i> Hughes, Miller, & Gallivan	177. <i>Understanding and Developing Skills Needed to Build on Student Mathematical Thinking-</i> Leatham, Stockero, Peterson, & Van Zoest
<b>Phoenix A</b>	162. <i>Behind the Curtain: Technology Use in Schools-</i> Wieman, Bowen, Hollebrands, & Males	178. <i>Integrating a Justice Focus into a Practice-Based Math Methods Course: Redesign Efforts and Open Questions-</i> Ball & DeFino
<b>Phoenix B</b>	163. <i>Addressing the Needs of Mathematics Teacher Educators through Collaborative Leadership between AMTE and AMTE Affiliates-</i> Stephan, Franz, Tjoe, & Kulow	179. <i>Cultivating Positive Mathematical Dispositions via Teaching: Building PSTs' Mathematical Dispositions through Early Mediated Field Experiences-</i> Billings & Swartz
<b>Phoenix D</b>	164. <i>Facilitating Productive Mathematical Discussions: Digging Deeper into the Five Practices-</i> Smith	180. <i>A Case of Differentiating Instruction for Prospective Secondary Teachers-</i> Hackenberg, Borowski, & Jones
<b>Phoenix E</b>	165. <i>Coming to Know Number Talks: Elementary PSTs' Mathematical Discourse Practices-</i> Raymond	181. <i>Secondary Mathematics Education Program Recruitment and Retention across US IHEs in the MTE-Partnership-</i> Fernandez, McNamara, Franz, Barrett, & Fry Bohlin

**10:30 AM - 11:30 AM**

<b>Desert Sky</b>	182. <i>Exploring Mathematical Knowledge for Teaching Secondary Mathematics: Engaging with Experts-</i> Zimmerman & Wilson
<b>Cave Creek</b>	183. <i>Using modeling &amp; simulation applications to help develop TPACK in preservice mathematics teachers-</i> Enderson & Watson
<b>Ahwatukee A</b>	184. <i>Developing a Typology for "Real World" Mathematics Problems-</i> Simic-Muller & Fernandes
<b>Ahwatukee B</b>	185. <i>Brief Report Session: Discussions and Dilemmas-</i> Leshin & LaMar; Woods; King & Smith
<b>Laveen A</b>	186. <i>Brief Report Session: Reflection and Interaction with Elementary Prospective Teachers-</i> Karunakaran & Voogt; Meiners; Gerstenschlager & Wessman-Enzinger
<b>Laveen B</b>	187. <i>Making Sense of Numbers: A Mixed-Methods Study of Preservice Elementary Teachers' Number Concepts Knowledge-</i> Starks, Feldman, & Gibbons
<b>South Mountain</b>	188. <i>Rich Mathematics Curricula Brought to you by CPM, an Educational Nonprofit! -</i> Randon
<b>Estrella</b>	189. <i>Using Lesson Plays to Assess Prospective Teachers' Pedagogical Understandings in Mathematics Methods Courses-</i> Moss & Divis
<b>Maryvale A</b>	190. <i>Hybrid Courses for Preparing Elementary Mathematics Specialists: Challenges, Successes and Lessons Learned-</i> Pitvorec & Tavormina
<b>Maryvale B</b>	191. <i>Preparing Teachers to Build on Families' Mathematical Experiences-</i> Civil, Stoehr, & Salazar
<b>Encanto A</b>	192. <i>Learning to Question in Lesson Debriefing-</i> Kastberg, Chen, Richardson, & Aqazade
<b>Encanto B</b>	193. <i>Enacting the Standards for Preparing Teachers of Mathematics: What Are We Learning?-</i> Martin, Bay-Williams, Bezuk, & Clements
<b>Phoenix A</b>	194. <i>Exploring the Use of Book Writing to Improve Student and PST Mathematical Understanding-</i> Wheeler & Mallam
<b>Phoenix B</b>	195. <i>The Design, Development, and Implementation of Online Courses for Mathematics Teacher Education-</i> Browning, Fede, Chauvot, Dean, & Silverman
<b>Phoenix D</b>	196. <i>Facilitating Critical Conversations among Mathematics Teachers with Rehearsals and Scenario Cards-</i> Marshall, McCloskey, & Chao
<b>Phoenix E</b>	197. <i>Sanctioned vs Unsanctioned: Navigating Online Resources and Preparing Teachers to Become Critical Curators and Adapters-</i> Dick

**Session 150**

Desert Sky

**BRIEF REPORT SESSION: BELIEFS AND WAYS OF THINKING****PROSPECTIVE ELEMENTARY TEACHERS' SENSE OF BELONGING IN MATHEMATICS AND SCIENCE**

Shannon P Sweeny, Northern Arizona University  
Gina Marie Nabours, Northern Arizona University

Our study aims to understand how prospective elementary teachers' sense of belonging in mathematics and science might be impacted by participating in a nontraditional practicum experience with a STEM-focused summer camp.

**STEM WAYS OF THINKING IN MATHEMATICS TEACHER EDUCATION**

David Slavitt, Washington State University, Vancouver  
Kristin Lesseig, Washington State University, Vancouver

We explore the question: How can STEM Ways of Thinking (SWoT) be made visible to prospective teachers, and what might this look like in the constraints of typical teacher education programs. Future collaborations with session attendees will be sought.

**TEACHER BELIEFS AND PRACTICE IN THE AREA OF PROOF AND THEIR INFLUENCE ON STUDENTS**

Foster Graif, University of Minnesota

In this session, I will engage participants with my efforts to connect a teacher's beliefs about proof to their teaching practice and the influence of these factors on students. Participants will discuss strategies to develop productive beliefs in teacher education.

**Session 151**

Cave Creek

*Mathematics Pedagogy*  
*Individual Session*

**LETTING GO: CULTIVATING AGENCY AND AUTHORITY THROUGH NUMBER TALKS IN THE SECONDARY MATHEMATICS CLASSROOM**

Cathy Humphreys, Mathematics Education Collaborative

This session documents a study of two preservice teachers who, supported by guided peer collaboration, enacted ten Number Talks over five weeks. The findings suggest that as the teachers learned to elicit students' thinking, students' intellectual authority and agency emerged.

**Session 152**

Ahwatukee A

**BRIEF REPORT SESSION: INTERDISCIPLINARY TEACHER PREPARATION****ADDRESSING TENSIONS WHEN TEACHING WITH TECHNOLOGY**

Lindsay Reiten, University of Northern Colorado

This session identifies tensions secondary mathematics teachers faced when shifting their practice towards teaching with technology. Addressing tensions within PD and teacher preparation, and using tensions as a catalyst for shifting teachers' practices towards teaching with technology, will be discussed

**MIND THE GAP: CAPITALIZING ON PRE-SERVICE TEACHER'S MATHEMATICAL GIFTS TO MEET SECONDARY SCHOOL NEEDS**

Valorie L. Zonnefeld, Dordt University  
Ryan Zonnefeld, Dordt University

Innovative teacher preparation programs are essential to ensure that secondary school students receive instruction from a certified teacher. This brief report explores interdisciplinary mathematics degrees that result in licensure in mathematics and physics, engineering, or computer science.

**PREPARING INTERDISCIPLINARY PRACTITIONERS: AN INNOVATIVE APPROACH IN SECONDARY TEACHER PREPARATION**

Jennifer Ruef, University of Oregon  
Rosa Del Carmen Chavez, Stanford University

Interdisciplinary teaching is often promoted yet rarely supported within secondary teacher education. This presentation shares research on one university-based interdisciplinary curriculum and instruction program, including the structure of its mathematics course, resultant teacher learning, and tensions that arose in implementation.

**Session 153**

Ahwatukee B

*Equity, Social Justice, and Mathematics Teacher Education*  
*Individual Session*

**PREPARING TEACHERS TO TEACH STATISTICS AND THE ROLE OF HETERONORMATIVE CRITIQUE**

Megan Parise Schmidt, University of Minnesota

I will share results from a study which examined the role of sex, gender, and heteronormativity in statistics textbooks using critical discourse analysis. Participants will learn strategies to critique curriculum content while engaging pre-service teachers in developing statistical thinking skills.

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**Session 154****Laveen A***Collaborations and Partnerships  
Individual Session***COLLABORATING FOR CHANGE: A LONGITUDINAL PROFESSIONAL DEVELOPMENT PROJECT FOR INCLUSIVE ELEMENTARY CLASSROOMS**Kristin E. Harbour, University of South Carolina  
Stefanie D. Livers, Missouri State University

A change in instructional and collaborative practices is critical for creating equitable mathematics instruction. We highlight a framework and results from a longitudinal professional development project with elementary general and special education teachers addressing coteaching, differentiation, and high quality tasks.

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**Session 155****Laveen B****BRIEF REPORT SESSION: ELEMENTARY TEACHER LEARNING AND ASSESSMENT****LEARNING FROM PRESERVICE EARLY CHILDHOOD/ELEMENTARY TEACHERS IN MATHEMATICS CONTENT COURSES**

Sharon K. O'Kelley, Francis Marion University

Results will be presented from a study that tracked 12 elementary preservice teachers through three content courses as they documented their experiences in questionnaires. A theme to be discussed is the role lesson presentation may play in developing productive disposition.

**PRESERVICE TEACHERS' INACCURACIES WHEN CONSTRUCTING AND ANALYZING ALGEBRAIC PATTERNS**Terri L. Kurz, Arizona State University  
Mi Yeon Lee, Arizona State University

Preservice teachers created patterns using color tiles, which included quadratic pattern generalization problems as well as linear and geometric pattern problems. Their difficulties with spatial misconceptions, challenges in explaining and analyzing patterns and improper use of algebraic language are discussed.

**UNITS COORDINATING ASSESSMENT OF PRESERVICE TEACHERS: CHALLENGES AND INSIGHTS**Sarah Kerrigan, Virginia Tech  
Catherine Ulrich, Virginia Tech

Units coordination (UC) helps characterize student thinking in several mathematical learning standards including fractions and algebra. We discuss the construct, how it is used by teachers and teacher educators, and recent research findings in challenges with assessing preservice teachers.

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**Session 156****South Mountain***Mathematics Pedagogy  
Discussion Session***PRACTICING PURPOSEFUL QUESTIONING: ALIGNMENT BETWEEN SECONDARY PROSPECTIVE TEACHERS' PLANNED AND ENACTED QUESTIONS DURING EARLY FIELD EXPERIENCES**Sheila Orr, Michigan State University  
Kristen N. Bieda, Michigan State University  
Melissa Warner Hale, Michigan State University  
Kevin Voogt, Michigan State University

Participants will learn about and discuss how secondary mathematics PSTs' incorporate purposeful questions into instruction during early field experiences. We will analyze alignment between questioning from plan to enactment relating to cognitive demand of planned and enacted tasks.

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**Session 157****Estrella***Teaching and Learning with Technology  
Discussion Session***INCORPORATING IMMERSIVE 360 VIDEO IN MATHEMATICS TEACHER EDUCATION: POTENTIAL AND CHALLENGES**Karl W. Kosko, Kent State University  
Tracy Weston, Middlebury College  
Julie Amador, University of Idaho

Participants will engage in activities and discussions about using 360 video in elementary mathematics teacher education. Following a brief overview and video experience, participants will examine connections with AMTE standards and evaluate the potential and challenges of using such media.

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**Session 158****Maryvale A***Equity, Social Justice, and Mathematics Teacher Education  
Individual Session***DEVELOPING EQUITY LITERACY IN THE STATISTICAL EDUCATION OF TEACHERS**Stephanie Casey, Eastern Michigan University  
Melody Wilson, University of Michigan

The MODULE(S2) Project has developed free teacher education materials that develop knowledge for teaching statistics along with equity literacy. Come learn about the materials, engage in selected activities, and learn about research results from field testing the materials.

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**Session 159****Maryvale B***Equity, Social Justice, and Mathematics Teacher Education  
Individual Session***GRACE IN LEARNING: A NECESSARY CONDITION OF EQUITABLE PRACTICES IN THE MATHEMATICS CLASSROOM**Joel Amidon, University of Mississippi  
Anne Marie Marshall, Lehman College  
Rebecca E. Smith, University of North Alabama

In this session, we explore the role of Grace in learning (GiL), as a necessary condition to promote equitable practices in the mathematics classroom. We argue GiL provides novices inroads to respond to calls towards equitable mathematics teaching practices.

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**Session 160** **Encanto A**  
*Professional Development  
Individual Session*

### **WHY DO YOU ASK...?**

Kaili Hardamon, Detroit Public Schools Community District  
What impact does your beliefs have on your question-asking practices? This session will allow participants to engage in reflection on their beliefs about mathematics teaching and learning and discuss the implications of beliefs for question-asking during instruction.

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**Session 161** **Encanto B**  
*Equity, Social Justice, and Mathematics Teacher Education  
Discussion Session*

### **RE-ENVISIONING MATHEMATICS EDUCATION PROGRAMS TO BUILD EQUITABLE TEACHING PRACTICES**

Elizabeth Hughes, University of Northern Iowa  
Catherine Miller, University of Northern Iowa  
Heather Gallivan, University of Northern Iowa

We will discuss strategies for moving from a few activities in select courses taught only by faculty who do research in equity to a mathematics education program where equity and social justice are part of its identity.

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**Session 162** **Phoenix A**  
*Teaching and Learning with Technology  
Symposium*

### **BEHIND THE CURTAIN: TECHNOLOGY USE IN SCHOOLS**

Rob Wieman, Rowan University  
Brian Bowen, West Chester University  
Karen Hollebrands, North Carolina State University  
Joshua R. Males, Lincoln Public Schools

When it comes to instructional technology, what does the gap between research and practice look like? Three panelists representing a wide range of practical experience will answer this question, and think with us about what we can do in response.

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**Session 163** **Phoenix B**  
*Mathematics Education Policy and Program Issues  
Symposium*

### **ADDRESSING THE NEEDS OF MATHEMATICS TEACHER EDUCATORS THROUGH COLLABORATIVE LEADERSHIP BETWEEN AMTE AND AMTE AFFILIATES**

Michelle Stephan, University of North Carolina, Charlotte  
Dana Pomykal Franz, Mississippi State University  
Hartono Tjoe, Pennsylvania State University, Berks  
Torrey Kulow, Portland State University

The purpose of this session is to engage AMTE affiliate leaders and members in a discussion with ATME Board of Directors to build seamless collaboration.

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**Session 164** **Phoenix D**  
*Mathematics Pedagogy  
Individual Session*

### **FACILITATING PRODUCTIVE MATHEMATICAL DISCUSSIONS: DIGGING DEEPER INTO THE FIVE PRACTICES**

Margaret Smith, University of Pittsburgh

This session will focus on the challenges teacher encounter when they engage in orchestrating classroom discussions and provide insights into how teachers can address these challenges.

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**Session 165** **Phoenix E**  
*Practice-Based Experiences for Prospective Teachers  
Individual Session*

### **COMING TO KNOW NUMBER TALKS: ELEMENTARY PSTS' MATHEMATICAL DISCOURSE PRACTICES**

Kate M. Raymond, University of Oklahoma

Number talks can serve as a tool for developing discourse. This session examines the discourse components PSTs attended to when developing and implementing number talks as part of a field placement. Participants will analyze changes in the PSTs' discourse practices.



Session 166

Desert Sky

**BRIEF REPORT SESSION: MATHEMATICAL PRACTICES****CONNECTING TEACHER'S PRIORITIZATION OF MATHEMATICAL PRACTICES AND STUDENTS' RELATIONSHIPS WITH MATHEMATICS**

Tanya LaMar, Stanford University

This presentation will share the findings of a case study on which mathematical practices two teachers prioritize in their recently de-tracked algebra one classrooms. We will also share how these practices are reflected in the students' relationships with mathematics.

**PRACTICES IN PRACTICE: INTERPRETING THE COMMON CORE MATHEMATICAL PRACTICES IN THE CONTEXT OF TEACHING PRACTICE**

Jillian Peterson Mortimer, University of Michigan

Participants will explore the Common Core State Standard for Mathematical Practice and how they can be seen in curriculum materials. Participants will discuss the implications of these practices on the work beginning teachers do and how to best support them.

**TEACHER UNDERSTANDING OF THE MATHEMATICAL PRACTICES: A LAY OF THE LAND**

Marcy B. Wood, The University of Arizona

In this study, we explore teachers' understanding of two mathematical practices (making sense of problems and persevering in solving them and constructing viable arguments) and trace how teachers' understanding might limit or enhance the implementation of these practices in everyday classrooms.

Session 167

Cave Creek

*Development of Mathematics Teacher Educators  
Discussion Session*

**SHARING OUR WAY OUT OF ISOLATION**Amber Grace Candela, University of Missouri, St. Louis  
Zandra de Araujo, University of Missouri

We provide an opportunity for mathematics teacher educators to come together and share best practices from methods courses. We seek to create a collaborative community of teacher educators that will extend beyond the conference to share lessons and activities.

Session 168

Ahwatukee A

**BRIEF REPORT SESSION: INTEGRATED STEM INSTRUCTION****DEVELOPING AN INTEGRATED STEM CURRICULUM IN PARTNERSHIP WITH ENGINEERS AND TEACHERS**Mollie Appelgate, Iowa State University  
Christa Jackson, Iowa State University  
Kari Nicole Jurgenson, Iowa State University

In this session we will share the benefits and challenges of designing and implementing an integrated STEM curriculum in collaboration with engineers and teachers over three years, including processes supportive of productive collaboration and how we addressed issues that arose.

**THE EVOLUTION OF TEACHERS' PERCEPTIONS OF INTEGRATED STEM EDUCATION OVER THREE YEARS**Kari Nicole Jurgenson, Iowa State University  
Mollie Appelgate, Iowa State University

This study investigates how teachers' implementation of an integrated STEM curriculum over three years influenced their perception of STEM instruction. Although the teachers had some initial concerns, as they implemented the integrated STEM curriculum their perceptions of STEM evolved.

Session 169

Ahwatukee B

*Equity, Social Justice, and Mathematics Teacher Education  
Individual Session*

**THREE LENSES ON EQUITY FOR MATHEMATICS CONTENT TEACHERS**Maria del Rosario Zavala, San Francisco State University  
Kimberly Seashore, San Francisco State University  
Ksenija Simic-Muller, Pacific Lutheran University  
Mathew D. Felton-Koestler, Ohio University

This interactive workshop will support new and experienced mathematics content teachers to reflect deeply on how equity is framed in their own teaching, and provide concrete ideas of how to expand notions of equity in new directions.

Session 170

Laveen A

*Mathematics Content and Curriculum  
Individual Session*

**MULTIPLICATIVE STRUCTURE: HELPING PROSPECTIVE ELEMENTARY TEACHERS SHED THEIR DEPENDENCE ON GUESS-AND-CHECK METHODS**

Ziv Feldman, Boston University

This session examines pre- and post-assessments of 496 prospective elementary teachers who experienced the same set of lessons in their mathematics content courses. Attendees will analyze lesson materials and participants' written work to better understand how to support PTs' learning.

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**Session 171****Laveen B****BRIEF REPORT SESSION: DEVELOPING MATHEMATICAL KNOWLEDGE FOR TEACHING****MODELING PROSPECTIVE TEACHERS' SCK DEVELOPMENT FOR DIVISION OF WHOLE NUMBERS**

Julien Corven, University of Delaware

This study examined factors that might predict attainment and growth of SCK for division of whole numbers among 59 prospective teachers. Prior knowledge of rational number concepts emerged as a strong predictor, and implications of this finding will be discussed.

**PRESERVICE TEACHERS' KNOWLEDGE OF CONTENT AND STUDENTS: THE CASE OF AREA MEASUREMENT**Sayonita Ghosh Hajra, California State University, Sacramento  
Ayse Ozturk, The Ohio State University

We examine connections made by preservice teachers among their knowledge of area measurement, the meaning of multiplication, and their interpretation of a child's reasoning about the area formula for a rectangle.

**USING A LEARNING TRAJECTORY TO DEVELOP PROSPECTIVE ELEMENTARY TEACHERS' KCS IN AN INTRODUCTORY CONTENT COURSE**Andrew Tyminski, Clemson University  
Alison Castro Superfine, University of Illinois, Chicago

We present results of our study of an intervention in a first semester content course utilizing the Ongoing Assessment Project (OGAP) multiplication framework to scaffold elementary PTs' Knowledge of Content and Students (KCS) using a trajectory of children's multiplicative reasoning.

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**Session 172****South Mountain***Mathematics Pedagogy  
Individual Session***PROMOTING CURIOSITY AND WONDER THROUGH FAMILY MATHEMATICS AND SCIENCE NIGHTS**Mahtob Aqazade, Purdue University  
Laura C. Bofferding, Purdue University  
Sue Ellen Richardson, Purdue University  
Amber Simpson, Binghamton University, SUNY

We explored how prospective elementary teachers planned activities to promote curiosity and wonder for a family mathematics and science night. Based on reflections of their activities, their conceptions of how to promote curiosity and wonder often became more nuanced.

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**Session 173****Estrella***Mathematics Education Policy and Program Issues  
Discussion Session***LEVERAGING THE EDTPA AND STANDARDS FOR PREPARING TEACHERS OF MATHEMATICS: SUPPORTING PSTS' DEVELOPMENT OF PRACTICE**Kathleen Nitta, Gonzaga University  
Maria Moscatelli, All Academic  
Amy Roth McDuffie, Washington State University

A majority of states require the edTPA as part of teacher licensure. We present two approaches that leverage the edTPA to support preservice teachers' development and discuss connections to AMTE's Standards for Preparing Teachers of Mathematics.

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**Session 174****Maryvale A***Mathematics Content and Curriculum  
Individual Session***TRACKING PRESERVICE TEACHERS' GESTURING ON RIEMANN SUM TASKS**

Tiffany LaCroix, Virginia Tech

The purpose of this presentation is to share the qualitative results and implications from examining the gestures preservice teachers use on Riemann sum tasks, and if gesturing is linked to a more sophisticated conception of the definite integral.

---

**Session 175****Maryvale B***Collaborations and Partnerships  
Individual Session***COLLABORATING NATIONALLY AND ACTING LOCALLY TO ENHANCE CLINICAL EXPERIENCES USING COTEACHING STRATEGIES**Jamalee Stone, Black Hills State University  
Jennifer Oloff-Lewis, California State University, Chico  
Cynthia Ann Castro-Minnehan, University of South Florida  
Pier Angeli Junor Clarke, Georgia State University  
Charity Cayton, East Carolina University

We will discuss how eleven mathematics teacher educators, in six states, collaborated to transform their mathematics education programs' clinical experiences using coteaching strategies. The mathematics teacher educators used plan-do-study-act (PDSA) cycles to facilitate institutional changes over time.

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**Session 176****Encanto A***Equity, Social Justice, and Mathematics Teacher Education  
Discussion Session***MIDDLE AND SECONDARY PROSPECTIVE TEACHERS' MOTIVATIONS TO IMPLEMENT SOCIAL JUSTICE MATHEMATICS LESSONS**Lateefah Id-Deen, Kennesaw State University  
Erin E. Baldinger, University of Minnesota  
Kathy Sun, Santa Clara University  
Patrice Parker Waller, California State University, Fullerton

After PSTs engaged in our module across our institutions, they self-reported beliefs indicated enthusiasm for integrating social justice in their mathematics instruction. Our session discusses ways to create opportunities towards actual implementation of social justice tasks into their mathematics instruction.

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**Session 177****Encanto B***Professional Development  
Individual Session***UNDERSTANDING AND DEVELOPING SKILLS NEEDED TO BUILD ON STUDENT MATHEMATICAL THINKING**Keith Rigby Leatham, Brigham Young University  
Shari L. Stockero, Michigan Technological University  
Blake E. Peterson, Brigham Young University  
Laura Van Zoest, Western Michigan University

We will discuss the teaching practice of building on student mathematical thinking, unpacking important nuances of this practice. Together we will consider how we as mathematics teacher educators can help teachers to develop skills related to these nuances.

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**Session 178** **Phoenix A**  
*Equity, Social Justice, and Mathematics Teacher Education*  
*Individual Session*

**INTEGRATING A JUSTICE FOCUS INTO A PRACTICE-BASED MATH METHODS COURSE: REDESIGN EFFORTS AND OPEN QUESTIONS**

Deborah Loewenberg Ball, University of Michigan  
Rosalie DeFino, University of Michigan

This session presents collaborative redesign efforts to interweave a justice focus into a practice-based elementary math methods course. Tensions, challenges, and questions for future work will be discussed.

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**Session 179** **Phoenix B**  
*Practice-Based Experiences for Prospective Teachers*  
*Individual Session*

**CULTIVATING POSITIVE MATHEMATICAL DISPOSITIONS VIA TEACHING: BUILDING PSTS' MATHEMATICAL DISPOSITIONS THROUGH EARLY MEDIATED FIELD EXPERIENCES**

Esther Marie Billings, Grand Valley State University  
Barbara Ann Swartz, McDaniel College

We describe how the use of mediated field experiences, a practice-based teacher education design grounded in AMTE's SPTE, motivates, develops, and deepens preservice elementary teachers' mathematical dispositions and understanding of what it means to do and teach mathematics.

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**Session 180** **Phoenix D**  
*Mathematics Pedagogy*  
*Individual Session*

**A CASE OF DIFFERENTIATING INSTRUCTION FOR PROSPECTIVE SECONDARY TEACHERS**

Amy Jeanne Hackenberg, Indiana University, Bloomington  
Rebecca Sue Borowski, Indiana University  
Robin Jones, Indiana University, Bloomington

In this session participants will engage in a video case of differentiating instruction (DI) for prospective secondary teachers developed from a research project on DI for middle school students. The case highlights the close connection between formative assessment and differentiation.

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**Session 181** **Phoenix E**  
*Mathematics Education Policy and Program Issues*  
*Symposium*

**SECONDARY MATHEMATICS EDUCATION PROGRAM RECRUITMENT AND RETENTION ACROSS US IHES IN THE MTE-PARTNERSHIP**

Maria L. Fernandez, Florida International University  
Julie McNamara, California State University, East Bay  
Dana Pomykal Franz, Mississippi State University  
Diane Barrett, University of Hawaii, Hilo  
Carol Fry Bohlin, California State University, Fresno

Various IHES will discuss strategies, approaches, toolkits and guides for successful recruitment and retention of prospective mathematics teachers. Attendees will use a student-centric logic model to analyze and discuss strengths and areas for growth in their program recruitment and retention.

**Session 182***Mathematics Content and Curriculum**Individual Session*

Desert Sky

**EXPLORING MATHEMATICAL KNOWLEDGE FOR TEACHING SECONDARY MATHEMATICS: ENGAGING WITH EXPERTS**

Stacey C. Zimmerman, University of North Carolina, Greensboro  
Holt Wilson, University of North Carolina, Greensboro

We share findings from a research project designed to elicit aspects of secondary mathematical knowledge for teaching from participants that have demonstrated expertise in the secondary mathematics field.

**Session 183***Teaching and Learning with Technology**Individual Session*

Cave Creek

**USING MODELING & SIMULATION APPLICATIONS TO HELP DEVELOP TPACK IN PRESERVICE MATHEMATICS TEACHERS**

Mary C. Enderson, Old Dominion University  
Ginger S. Watson, University of Virginia

This session will address the impact modeling & simulation applications may have on preservice mathematics teachers' development of TPACK. These teachers interact with applications as learners and then transition into creating experiences for middle and high school students.

**Session 184***Equity, Social Justice, and Mathematics Teacher Education**Individual Session*

Ahwatukee A

**DEVELOPING A TYPOLOGY FOR "REAL WORLD" MATHEMATICS PROBLEMS**

Ksenija Simic-Muller, Pacific Lutheran University  
Anthony Fernandes, University of North Carolina, Charlotte

This session presents preliminary results of a study that investigates how preservice K-8 teachers relate to different real-world contexts presented to them, and proposes a typology that can help gauge their openness to using similar contexts in their own teaching.

**Session 185**

Ahwatukee B

**BRIEF REPORT SESSION: DISCUSSIONS AND DILEMMAS****DILEMMAS: GRAPPLING WITH THEORY AND PRACTICE IN A CURRICULUM & INSTRUCTION CLASS**

Miriam Simone Leshin, Stanford University

Tanya LaMar, Stanford University

Learning to teach involves navigating dilemmas, which do not have a clear answer. This presentation explores how one Curriculum & Instruction course supported teacher candidates to manage, rather than resolve, the dilemmas that surfaced from their student teaching and coursework.

**PREPARING PRESERVICE TEACHERS TO LEAD MATHEMATICAL DISCUSSIONS BY EMBEDDING MIXED REALITY SIMULATIONS INTO METHODS COURSEWORK**

Dawn Woods, Oakland University

In this study I examined how mixed reality simulations support pre-service teachers in learning how to lead group discussions. Findings suggest that questioning strategies shifted from a funneling to a focusing approach since they had opportunities for feedback and reflection.

**USING THE CO-DEVELOPMENT OF APPROXIMATIONS OF PRACTICE TO IMPROVE TEACHING**

Barbara King, Florida International University

Carmen Smith, University of Vermont

We investigated how in-service teachers' (ISTs') understanding of classroom discussions evolved while co-creating approximations of practice activities. Our results showed an improvement in ISTs' use of effective discussion strategies. Specific aspects that potentially contributed to the change are discussed.

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**Session 186****Laveen A****BRIEF REPORT SESSION: REFLECTION AND INTERACTION WITH ELEMENTARY PROSPECTIVE TEACHERS****ADDRESSING ELEMENTARY PRE-SERVICE TEACHERS' MATHEMATICS ANXIETY**Monica Karunakaran, Michigan State University  
Kevin Voogt, Michigan State University

Elementary preservice teachers' mathematics anxiety is a well-documented phenomenon. This presentation describes a policy that increased informal interactions between students and instructor during an elementary mathematics content course, and how such interactions have the potential to decrease students' mathematics anxiety.

**PRESERVICE TEACHERS' PERSISTENCE: WHAT HAPPENS WHEN CHALLENGING TASKS ARE USED?**

Amanda Meiners, University of Iowa

This study investigates how Pre-service Teacher's learning experiences and opportunities influence their persistence during challenging mathematics tasks. One intervention showing promising results is a mindset intervention. Results indicate that two themes developed: influences that advance and influences that hinder persistence.

**SUPPORTING PRESERVICE TEACHERS' REFLECTION ABOUT CONCEPTUAL MISTAKES**Natasha Gerstenschlager, Western Kentucky University  
Nicole M. Wessman-Enzinger, George Fox University

We will discuss results from a project where elementary preservice teachers reflected on conceptual mistakes in mathematics content courses. Participants will examine this project, including a rubric, for their potential use and gain insight into how PSTs perceive mistakes.

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**Session 187****Laveen B***Mathematics Content and Curriculum*  
*Individual Session***MAKING SENSE OF NUMBERS: A MIXED-METHODS STUDY OF PRESERVICE ELEMENTARY TEACHERS' NUMBER CONCEPTS KNOWLEDGE**Rachel Starks, Boston University  
Ziv Feldman, Boston University  
Lynsey Gibbons, Boston University

This session explores curriculum materials surrounding number concepts and test data collected from 592 PSTs who experienced this curriculum. Session participants will examine the lesson and PSTs' work, considering how to support their own PSTs in developing understanding of number.

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**Session 188****South Mountain***Individual Session***RICH MATHEMATICS CURRICULA BROUGHT TO YOU BY CPM, AN EDUCATIONAL NONPROFIT!**

Sharon Rendon, CPM

Looking for ideas to incorporate NCTM's eight teaching practices in your courses? Experience CPM's student-centered, problem based curricula, which encourages thinking, persevering, and sense-making. You can have CPM's 6-12 curriculum for your library or to use in your methods courses

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**Session 189****Estrella***Mathematics Pedagogy*  
*Individual Session***USING LESSON PLAYS TO ASSESS PROSPECTIVE TEACHERS' PEDAGOGICAL UNDERSTANDINGS IN MATHEMATICS METHODS COURSES**Diana L. Moss, Utah State University  
Danielle Rose Divis, Utah State University

In this session, we present insights about using lesson plays for examining prospective teachers' pedagogical understandings in an online mathematics methods course and discuss modifications of the lesson play method for effective implementation in other mathematics methods courses.

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**Session 190****Maryvale A***Teaching and Learning with Technology*  
*Individual Session***HYBRID COURSES FOR PREPARING ELEMENTARY MATHEMATICS SPECIALISTS: CHALLENGES, SUCCESSES AND LESSONS LEARNED**Kathleen Pitvorec, University of Illinois, Chicago  
Mary Jo Tavormina, University of Illinois, Chicago

In this individual session, we will engage in exploring online course activities for a set of hybrid courses designed to prepare teachers to be elementary mathematics specialists. We will debrief the activities by reflecting on and discussing the course design.

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**Session 191****Maryvale B***Equity, Social Justice, and Mathematics Teacher Education*  
*Individual Session***PREPARING TEACHERS TO BUILD ON FAMILIES' MATHEMATICAL EXPERIENCES**Marta Civil, University of Arizona  
Kathleen Jablon Stoehr, Santa Clara University  
Fany Salazar, The University of Arizona

This session reports on a research and outreach project that engaged parents and teachers in dialogues about mathematics to uncover the learning opportunities that exist in the homes and communities of diverse students. Study protocols will be shared with participants.

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**Session 192****Encanto A***Development of Mathematics Teacher Educators*  
*Discussion Session***LEARNING TO QUESTION IN LESSON DEBRIEFING**Signe Kastberg, Purdue University  
Lizhen Chen, Purdue University  
Sue Ellen Richardson, Purdue University  
Mahtob Aqazade, Purdue University

Using excerpts from a prospective teacher's (PT) lesson plan and audio/transcript of her lesson description, participants will explore how caring relations can inform mathematics teacher educators' questioning practice during debriefing discussions of PTs' lessons taught in a clinical setting.

**Session 193****Encanto B***Mathematics Education Policy and Program Issues  
Discussion Session***ENACTING THE STANDARDS FOR PREPARING TEACHERS OF MATHEMATICS: WHAT ARE WE LEARNING?**W. Gary Martin, Auburn University  
Jennifer Bay-Williams, University of Louisville  
Nadine Bezuk, San Diego State University  
Douglas H. Clements, University of Denver

Since the release of the Standards for Preparing Teachers of Mathematics, AMTE members have begun to consider its implications for their practice. In this session, participants will share their personal journeys with the Standards and reflect on further actions needed.

**Session 194****Phoenix A***Mathematics Content and Curriculum  
Discussion Session***EXPLORING THE USE OF BOOK WRITING TO IMPROVE STUDENT AND PST MATHEMATICAL UNDERSTANDING**Ann Wheeler, Texas Woman's University  
Winifred Mallam, Texas Woman's University

During this Discussion session, we will detail a book project between 8th grade students and PSTs. Participants will discuss student and PST learning outcomes from the book project, as well as potential assignment modifications.

**Session 195****Phoenix B***Teaching and Learning with Technology  
Individual Session***THE DESIGN, DEVELOPMENT, AND IMPLEMENTATION OF ONLINE COURSES FOR MATHEMATICS TEACHER EDUCATION**Christine Browning, Western Michigan University  
Bryan Fede, Marquette University  
Jennifer B. Chauvot, University of Houston  
Chrystal Dean, Appalachian State University  
Jason Silverman, Drexel University

Various topic work stations will have participants engage in thinking about how to use effective teaching practices and address relevant standards when designing and implementing online mathematics teacher education courses. For maximum participation, please bring a laptop and earbuds.

**Session 196****Phoenix D***Equity, Social Justice, and Mathematics Teacher Education  
Individual Session***FACILITATING CRITICAL CONVERSATIONS AMONG MATHEMATICS TEACHERS WITH REHEARSALS AND SCENARIO CARDS**Anne Marie Marshall, Lehman College  
Andrea McCloskey, Pennsylvania State University  
Theodore Chao, The Ohio State University

Participants will examine a revised set of conversation cards that have been used to engage mathematics teachers in critical conversations. A set of cards will be provided to each participant and difficult teacher conversations will be explored through rehearsal.

**Session 197****Phoenix E***Mathematics Content and Curriculum  
Individual Session***SANCTIONED VS UNSANCTIONED: NAVIGATING ONLINE RESOURCES AND PREPARING TEACHERS TO BECOME CRITICAL CURATORS AND ADAPTERS**

Lara Dick, Bucknell University

We discuss teachers' online searches for math resources, including cognitive demand, from unsanctioned (e.g. Pinterest) and sanctioned (e.g. NCTM) sites. We will rate resources and engage in activities for PSTs and teachers to become critical consumers and adapters.

**SATURDAY, FEBRUARY 8, 2020****11:30 AM - 1:15 PM****AMTE****LUNCH AND BUSINESS MEETING**

Please join us for lunch, organizational updates, and official AMTE proceedings.

**PHOENIX C**

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Abbaspour Tazehkand, Shahabeddin	<i>University of Central Florida</i>	shaha8@knights.ucf.edu	117
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Burton, Megan	<i>Auburn University</i>	megan.burton@auburn.edu	129
Byun, Sunghwan	<i>Michigan State University</i>	byunsun3@msu.edu	74, 97

**C**

Callis, Laura	<i>Curry College</i>	<a href="mailto:laura.callis@curry.edu">laura.callis@curry.edu</a>	91
Candela, Amber Grace	<i>University of Missouri, St. Louis</i>	<a href="mailto:candela@umsl.edu">candela@umsl.edu</a>	116, 167
Cannon, Susan Ophelia	<i>Mercer University</i>	<a href="mailto:sosophelia@gmail.com">sosophelia@gmail.com</a>	50
Capen, Laurie M.	<i>George Mason University</i>	<a href="mailto:lcapen@gmu.edu">lcapen@gmu.edu</a>	75
Carroll, Cathy E.	<i>WestEd</i>	<a href="mailto:ccarrol@wested.org">ccarrol@wested.org</a>	102
Carson, Cynthia D.	<i>University of Rochester</i>	<a href="mailto:cynthiacarson17@gmail.com">cynthiacarson17@gmail.com</a>	102, 136
Casa, Tutita M.	<i>University of Connecticut</i>	<a href="mailto:tutita.casa@uconn.edu">tutita.casa@uconn.edu</a>	30, 101
Casey, Stephanie	<i>Eastern Michigan University</i>	<a href="mailto:scasey1@emich.edu">scasey1@emich.edu</a>	146, 158
Castro-Minnehan, Cynthia Ann	<i>University of South Florida</i>	<a href="mailto:ccastrominne@mail.usf.edu">ccastrominne@mail.usf.edu</a>	67, 175
Castro Superfine, Alison	<i>University of Illinois, Chicago</i>	<a href="mailto:amcastro@uic.edu">amcastro@uic.edu</a>	15, 171
Cavanna, Jillian M.	<i>University of Hartford</i>	<a href="mailto:cavanna@hartford.edu">cavanna@hartford.edu</a>	101
Cavey, Laurie	<i>Boise State University</i>	<a href="mailto:lauriecavey@boisestate.edu">lauriecavey@boisestate.edu</a>	104
Cayton, Charity	<i>East Carolina University</i>	<a href="mailto:caytonc@ecu.edu">caytonc@ecu.edu</a>	78, 175
Chandler, Kayla	<i>East Carolina University</i>	<a href="mailto:chandlerk@ecu.edu">chandlerk@ecu.edu</a>	142
Chao, Theodore	<i>The Ohio State University</i>	<a href="mailto:chao.160@osu.edu">chao.160@osu.edu</a>	196
Chauvot, Jennifer B.	<i>University of Houston</i>	<a href="mailto:jchauvot@uh.edu">jchauvot@uh.edu</a>	195
Chavez, Rosa Del Carmen	<i>Stanford University</i>	<a href="mailto:rdchavez@stanford.edu">rdchavez@stanford.edu</a>	152
Che, S. Megan	<i>Clemson University</i>	<a href="mailto:sche@clemson.edu">sche@clemson.edu</a>	47
Chen, Lizhen	<i>Purdue University</i>	<a href="mailto:lizchen@purdue.edu">lizchen@purdue.edu</a>	192
Chesler, Joshua	<i>California State University, Long Beach</i>	<a href="mailto:josh.chesler@csulb.edu">josh.chesler@csulb.edu</a>	77
Christensen, Sharon	<i>Brigham Young University</i>	<a href="mailto:sharonc@mathed.byu.edu">sharonc@mathed.byu.edu</a>	55
Cirillo, Michelle	<i>University of Delaware</i>	<a href="mailto:mcirillo@udel.edu">mcirillo@udel.edu</a>	105, 144
Civil, Marta	<i>University of Arizona</i>	<a href="mailto:civil@math.arizona.edu">civil@math.arizona.edu</a>	191
Clements, Douglas H.	<i>University of Denver</i>	<a href="mailto:douglas.clements@du.edu">douglas.clements@du.edu</a>	193
Cloward, Janessa	<i>Brigham Young University</i>	<a href="mailto:cloward.janessa@gmail.com">cloward.janessa@gmail.com</a>	53
Colonnese, Madelyn	<i>University of North Carolina, Charlotte</i>	<a href="mailto:mcolonn1@unc.edu">mcolonn1@unc.edu</a>	30
Conner, AnnaMarie	<i>University of Georgia</i>	<a href="mailto:aconner@uga.edu">aconner@uga.edu</a>	81
Conway, Basil	<i>Columbus State University</i>	<a href="mailto:conway_basil@columbusstate.edu">conway_basil@columbusstate.edu</a>	85
Cook, Alice L.	<i>Johns Hopkins University</i>	<a href="mailto:cookie.teach@gmail.com">cookie.teach@gmail.com</a>	31
Cooley, Laurel	<i>Brooklyn College, CUNY</i>	<a href="mailto:lcooley@brooklyn.cuny.edu">lcooley@brooklyn.cuny.edu</a>	28, 109
Corven, Julien	<i>University of Delaware</i>	<a href="mailto:jcorven@udel.edu">jcorven@udel.edu</a>	171
Cox, Dana C.	<i>Miami University</i>	<a href="mailto:dana.cox@miamioh.edu">dana.cox@miamioh.edu</a>	100
Creager, Mark A.	<i>University of Southern Indiana</i>	<a href="mailto:macreager@usi.edu">macreager@usi.edu</a>	52
Cullen, Craig	<i>Illinois State University</i>	<a href="mailto:cjculle@ilstu.edu">cjculle@ilstu.edu</a>	62

**D**

Davis, Ashley Renaire	<i>The Graduate Center, CUNY</i>	<a href="mailto:ashleyrenaire@gmail.com">ashleyrenaire@gmail.com</a>	3
Day, Roger	<i>Illinois State University</i>	<a href="mailto:day@ilstu.edu">day@ilstu.edu</a>	62
de Araujo, Zandra	<i>University of Missouri</i>	<a href="mailto:dearaujoz@missouri.edu">dearaujoz@missouri.edu</a>	22, 167
Dean, Chrystal	<i>Appalachian State University</i>	<a href="mailto:deanco@appstate.edu">deanco@appstate.edu</a>	93, 195
DeFino, Rosalie	<i>University of Michigan</i>	<a href="mailto:rdefino@umich.edu">rdefino@umich.edu</a>	178
Diamond, Jaime	<i>University of Georgia</i>	<a href="mailto:diamond@uga.edu">diamond@uga.edu</a>	14
Dick, Lara	<i>Bucknell University</i>	<a href="mailto:lara.dick@bucknell.edu">lara.dick@bucknell.edu</a>	103, 197
Dingman, Shannon W.	<i>University of Arkansas</i>	<a href="mailto:sdingman@uark.edu">sdingman@uark.edu</a>	61, 140
Divis, Danielle Rose	<i>Utah State University</i>	<a href="mailto:danielledivis21@gmail.com">danielledivis21@gmail.com</a>	189
Do, Seonmi	<i>Pennsylvania State University</i>	<a href="mailto:skd5312@psu.edu">skd5312@psu.edu</a>	144
Dobie, Tracy	<i>University of Utah</i>	<a href="mailto:tracy.dobie@utah.edu">tracy.dobie@utah.edu</a>	110, 119
Donnay, Victor	<i>Bryn Mawr College</i>	<a href="mailto:vdonnay@brynmawr.edu">vdonnay@brynmawr.edu</a>	117
Driskell, Shannon	<i>University of Dayton</i>	<a href="mailto:sdriskell1@udayton.edu">sdriskell1@udayton.edu</a>	20
Dubbs, Christopher	<i>Michigan State University</i>	<a href="mailto:dubbschr@msu.edu">dubbschr@msu.edu</a>	130
Dula, Jessica	<i>Horizon Research, Inc.</i>	<a href="mailto:j.dula@horizon-research.com">j.dula@horizon-research.com</a>	119
Dunleavy, Teresa K.	<i>Vanderbilt University</i>	<a href="mailto:teresa.kathleen.dunleavy@gmail.com">teresa.kathleen.dunleavy@gmail.com</a>	60, 87
Dupree, Lakesia L.	<i>University of South Florida</i>	<a href="mailto:ldupree@mail.usf.edu">ldupree@mail.usf.edu</a>	67, 117
Dyer, Penny	<i>Arizona State University</i>	<a href="mailto:padyer@asu.edu">padyer@asu.edu</a>	28

**E**

Ebby, Caroline B.	<i>University of Pennsylvania</i>	<a href="mailto:cbe@upenn.edu">cbe@upenn.edu</a>	39
Edenfield, Kelly	<i>University of Georgia</i>	<a href="mailto:kedenfield@uga.edu">kedenfield@uga.edu</a>	55
Edwards, Belinda Pickett	<i>Kennesaw State University</i>	<a href="mailto:bedwards@kennesaw.edu">bedwards@kennesaw.edu</a>	36, 141
Enderson, Mary C.	<i>Old Dominion University</i>	<a href="mailto:menderso@odu.edu">menderso@odu.edu</a>	183
Erickson, Ander	<i>University of Washington, Tacoma</i>	<a href="mailto:awerick@uw.edu">awerick@uw.edu</a>	19
Eskelson, Samuel L.	<i>University of Northern Iowa</i>	<a href="mailto:samuel.eskelson@uni.edu">samuel.eskelson@uni.edu</a>	90



**F**

Fede, Bryan	<i>Marquette University</i>	bryan.fede@marquette.edu	195
Feldman, Ziv	<i>Boston University</i>	zfeld@bu.edu	170, 187
Felton-Koestler, Mathew D.	<i>Ohio University</i>	felton@ohio.edu	169
Fernandes, Anthony	<i>University of North Carolina, Charlotte</i>	anthony.fernandes@uncc.edu	36, 184
Fernandez, Maria L.	<i>Florida International University</i>	mfernand@fiu.edu	181
Ferry, Deborah	<i>Macomb Independent School District</i>	dferry@misd.net	8
Fisher, Molly	<i>University of Kentucky</i>	molly.fisher@uky.edu	133
Flessner, Courtney	<i>Indiana University</i>	cflessne@iu.edu	117
Flessner, Ryan	<i>Butler University</i>	rflessne@butler.edu	117
Foster, Jonathan	<i>University of Georgia</i>	fosterjk@uga.edu	145
Franke, Megan	<i>University of California, Los Angeles</i>	mfranke@ucla.edu	46
Franz, Dana Pomykal	<i>Mississippi State University</i>	df76@colled.msstate.edu	163, 181
Fry Bohlin, Carol	<i>California State University, Fresno</i>	carolb@csufresno.edu	181
Fye, Kristen	<i>University of North Carolina, Charlotte</i>	krfye@uncc.edu	78

**G**

Galindo, Enrique	<i>Indiana University</i>	egalindo@indiana.edu	24
Gallagher, Melissa A.	<i>University of Louisiana, Lafayette</i>	magallagher27@gmail.com	13, 65
Gallivan, Heather	<i>University of Northern Iowa</i>	heather.gallivan@uni.edu	161
Ganesh, Tirupalavanam G.	<i>Arizona State University</i>	tganesh@asu.edu	28
Garcia, Nicole M.	<i>University of Michigan</i>	nmgarcia@umich.edu	72
Garner, Brette	<i>University of Denver</i>	brette.garner@du.edu	57
Gatza, Andrew	<i>Indiana University</i>	agatza@iu.edu	147
Gay, Susan	<i>University of Kansas</i>	sgay@ku.edu	37
Gerstenschlager, Natasha	<i>Western Kentucky University</i>	natasha.gerstenschlager@wku.edu	186
Ghosh Hajra, Sayonita	<i>California State University, Sacramento</i>	sayonita.ghoshhajra@csus.edu	171
Gibbons, Lynsey	<i>Boston University</i>	lgibbons@bu.edu	138, 187
Gichobi, Mary N.	<i>University of Wisconsin, Green Bay</i>	gichobim@uwgb.edu	132
Gillespie, Ryan	<i>University of Idaho</i>	gill6762@vandals.uidaho.edu	136
Glassmeyer, David	<i>Kennesaw State University</i>	dglassme@kennesaw.edu	141
Goldberg, Ellyn Rose	<i>The University of Texas, Austin</i>	ellie.goldberg@utexas.edu	117
Goldsmith-Markey, Lindsay Thompson	<i>University of Pennsylvania</i>	litho@gse.upenn.edu	39
Gomez, Carlos Nicolas	<i>Clemson University</i>	carlos@clemson.edu	44, 74
Gonzalez, Monica	<i>East Carolina University</i>	gonzalezmo18@ecu.edu	27
Goodson-Espy, Tracy J.	<i>Appalachian State University</i>	goodsonespyt@appstate.edu	93
Gordon, Evelyn M.	<i>Horizon Research, Inc.</i>	egordon@horizon-research.com	119
Graif, Foster	<i>University of Minnesota</i>	fgraif@umn.edu	150
Grant, Theresa Jean	<i>Western Michigan University</i>	terry.grant@wmich.edu	124
Groves-Scott, Victoria	<i>University of Central Arkansas</i>	vickigs@uca.edu	96
Gruver, John	<i>Michigan Technological University</i>	jgruver@mtu.edu	4
Gupta, Dittika	<i>Midwestern State University</i>	dittika.gupta@msutexas.edu	117
Gutierrez, Rochelle	<i>University of Illinois, Urbana-Champaign</i>	rg1@illinois.edu	143

**H**

Hackenberg, Amy Jeanne	<i>Indiana University, Bloomington</i>	ahackenb@indiana.edu	180
Hale, Melissa Warner	<i>Michigan State University</i>	halemeli@msu.edu	117, 156
Hansen, Heidi B.	<i>Bemidji State University</i>	hhansen@bemidjistate.edu	70
Harbour, Kristin E.	<i>University of South Carolina</i>	kharbour@mailbox.sc.edu	95, 154
Hardamon, Kaili	<i>Detroit Public Schools Community District</i>	kaili7d7@yahoo.com	160
Hardison, Hamilton	<i>Texas State University</i>	hhardison@txstate.edu	79
Harper, Frances K.	<i>University of Tennessee, Knoxville</i>	francesharper@utk.edu	59, 108
Harper, Suzanne R.	<i>Miami University</i>	harpersr@miamioh.edu	100
Harrell-Williams, Leigh	<i>University of Memphis</i>	leigh.williams@memphis.edu	104
Harris, Pamela	<i>Arizona State University</i>	harris9@asu.edu	28, 98
Harrison, Taylor	<i>North Carolina State University</i>	trharri2@ncsu.edu	146
Hawthorne, Casey W.	<i>Furman University</i>	casey.hawthorne@furman.edu	4
Heaton, Ruth M.	<i>Teachers Development Group</i>	ruth.heaton@teachersdg.org	106
Heid, Mary Kathleen	<i>Pennsylvania State University</i>	mkh2@psu.edu	68
Hempel, Alice	<i>University of New Hampshire</i>	aah2017@wildcats.unh.edu	105
Herbel Eisenmann, Beth	<i>Michigan State University</i>	bhe@msu.edu	12, 97
Hertel, Joshua	<i>University of Wisconsin, La Crosse</i>	jhertel@uwlax.edu	50
Hillman, Susan L.	<i>Saginaw Valley State University</i>	shillman@svsu.edu	25
Hinojosa, Denisse Maribel	<i>The University of Texas, San Antonio</i>	denisseh66@gmail.com	43
Hjalmarson, Margret	<i>George Mason University</i>	mhjalmar@gmu.edu	104
Hollebrands, Karen	<i>North Carolina State University</i>	kfholleb@ncsu.edu	162

Howell, Heather	<i>Educational Testing Service</i>	<a href="mailto:hhowell@ets.org">hhowell@ets.org</a>	2
Hudson, Rick A.	<i>University of Southern Indiana</i>	<a href="mailto:rhudson@usi.edu">rhudson@usi.edu</a>	146
Hughes, Elizabeth	<i>University of Northern Iowa</i>	<a href="mailto:elizabeth.hughes@uni.edu">elizabeth.hughes@uni.edu</a>	161
Hummel, Robin Ellen	<i>Bank Street College of Education</i>	<a href="mailto:rhummel@bankstreet.edu">rhummel@bankstreet.edu</a>	141
Humphreys, Cathy	<i>Mathematics Education Collaborative</i>	<a href="mailto:cathy.j.humphreys@gmail.com">cathy.j.humphreys@gmail.com</a>	151
<b>I</b>			
Id-Deen, Lateefah	<i>Kennesaw State University</i>	<a href="mailto:liddeen@kennesaw.edu">liddeen@kennesaw.edu</a>	176
<b>J</b>			
Jackson, Brent	<i>Michigan State University</i>	<a href="mailto:bjackson@msu.edu">bjackson@msu.edu</a>	12, 97
Jackson, Christa	<i>Iowa State University</i>	<a href="mailto:jacksonc@iastate.edu">jacksonc@iastate.edu</a>	74, 168
Jacobson, Erik	<i>Indiana University</i>	<a href="mailto:erdajaco@indiana.edu">erdajaco@indiana.edu</a>	5
Jensen, Jess	<i>California Polytechnic State University, San Luis Obispo</i>	<a href="mailto:jjense11@calpoly.edu">jjense11@calpoly.edu</a>	56, 65
Jessup, Naomi	<i>Georgia State University</i>	<a href="mailto:njessup@gsu.edu">njessup@gsu.edu</a>	87
Jett, Christopher C.	<i>University of West Georgia</i>	<a href="mailto:cjett@westga.edu">cjett@westga.edu</a>	9
Johnson, Nicholas Charles	<i>San Diego State University</i>	<a href="mailto:nicko@ucla.edu">nicko@ucla.edu</a>	46
Jones, Dusty	<i>Sam Houston State University</i>	<a href="mailto:dljones@shsu.edu">dljones@shsu.edu</a>	49
Jones, Robin	<i>Indiana University, Bloomington</i>	<a href="mailto:robijone@indiana.edu">robijone@indiana.edu</a>	180
Jones, Stacy R.	<i>Clemson University</i>	<a href="mailto:stacy9@clermson.edu">stacy9@clermson.edu</a>	44, 74
Junor Clarke, Pier Angeli	<i>Georgia State University</i>	<a href="mailto:pjunor@gsu.edu">pjunor@gsu.edu</a>	175
Jurgenson, Kari Nicole	<i>Iowa State University</i>	<a href="mailto:karij@iastate.edu">karij@iastate.edu</a>	168
<b>K</b>			
Kalinec-Craig, Crystal	<i>The University of Texas, San Antonio</i>	<a href="mailto:crystal.kalinec-craig@utsa.edu">crystal.kalinec-craig@utsa.edu</a>	43, 60
Karunakaran, Monica	<i>Michigan State University</i>	<a href="mailto:karunak2@msu.edu">karunak2@msu.edu</a>	186
Kaschner, Scott	<i>Butler University</i>	<a href="mailto:skaschne@butler.edu">skaschne@butler.edu</a>	34
Kastberg, Signe	<i>Purdue University</i>	<a href="mailto:skastber@purdue.edu">skastber@purdue.edu</a>	25, 192
Kasten, Sarah	<i>Northern Kentucky University</i>	<a href="mailto:kastens1@nku.edu">kastens1@nku.edu</a>	120
Kelley, Traci	<i>The University of Texas, San Antonio</i>	<a href="mailto:traci.kelley@utsa.edu">traci.kelley@utsa.edu</a>	43
Kerrigan, Sarah	<i>Virginia Tech</i>	<a href="mailto:stk123@vt.edu">stk123@vt.edu</a>	155
Khalil, Deena	<i>Howard University</i>	<a href="mailto:deena.khalil@howard.edu">deena.khalil@howard.edu</a>	109
Kim, Nicholas	<i>University of Tennessee, Knoxville</i>	<a href="mailto:nkim2@vols.utk.edu">nkim2@vols.utk.edu</a>	108
Kim, Young Rae	<i>Texas A&amp;M University, San Antonio</i>	<a href="mailto:youngrae.kim@tamusa.edu">youngrae.kim@tamusa.edu</a>	117
Kimmerling, Christina	<i>California State University, Long Beach</i>	<a href="mailto:christina.kimmerling@csulb.edu">christina.kimmerling@csulb.edu</a>	77
Kinach, Barbara	<i>Arizona State University</i>	<a href="mailto:barbara.kinach@asu.edu">barbara.kinach@asu.edu</a>	117
King, Barbara	<i>Florida International University</i>	<a href="mailto:bking@fiu.edu">bking@fiu.edu</a>	185
Kirschner, Sara	<i>George Mason University</i>	<a href="mailto:skirschn@gmu.edu">skirschn@gmu.edu</a>	135
Kirwan, J. Vince	<i>Kennesaw State University</i>	<a href="mailto:jkirwan@kennesaw.edu">jkirwan@kennesaw.edu</a>	47
Kline, Kate	<i>Western Michigan University</i>	<a href="mailto:kate.kline@wmich.edu">kate.kline@wmich.edu</a>	99, 124
Knapp, Melinda	<i>Oregon State University, Cascades</i>	<a href="mailto:melinda.knapp@osucascades.edu">melinda.knapp@osucascades.edu</a>	83, 138
Knotts, Angela	<i>WestEd</i>	<a href="mailto:angelaknotts@gmail.com">angelaknotts@gmail.com</a>	102
Koester, Mark	<i>Metropolitan State University of Denver</i>	<a href="mailto:koesterm@msudenver.edu">koesterm@msudenver.edu</a>	120
Koestler, Courtney	<i>Ohio University</i>	<a href="mailto:koestler@ohio.edu">koestler@ohio.edu</a>	51, 130
Kokka, Kari	<i>University of Pittsburgh</i>	<a href="mailto:kokka@pitt.edu">kokka@pitt.edu</a>	143
Kosko, Karl W.	<i>Kent State University</i>	<a href="mailto:kkosko1@kent.edu">kkosko1@kent.edu</a>	157
Kozak, Kathryn	<i>AMATYC</i>	<a href="mailto:kathryn.kozak@coconino.edu">kathryn.kozak@coconino.edu</a>	122
Krause, Gladys	<i>William and Mary</i>	<a href="mailto:ghkrause@wm.edu">ghkrause@wm.edu</a>	87
Krebs, Angela	<i>University of Michigan, Dearborn</i>	<a href="mailto:askrebs@umich.edu">askrebs@umich.edu</a>	124
Krupa, Erin Elizabeth	<i>North Carolina State University</i>	<a href="mailto:eekrupa@ncsu.edu">eekrupa@ncsu.edu</a>	104
Kulow, Torrey	<i>Portland State University</i>	<a href="mailto:kulow@pdx.edu">kulow@pdx.edu</a>	123, 163
Kurtz, Brianna Ashley	<i>University of Central Florida</i>	<a href="mailto:brianna.kurtz@ucf.edu">brianna.kurtz@ucf.edu</a>	44
Kurz, Terri L.	<i>Arizona State University</i>	<a href="mailto:terri.kurz@asu.edu">terri.kurz@asu.edu</a>	28, 155
<b>L</b>			
LaCroix, Tiffany	<i>Virginia Tech</i>	<a href="mailto:tlacroix@vt.edu">tlacroix@vt.edu</a>	174
LaMar, Tanya	<i>Stanford University</i>	<a href="mailto:tltamar@stanford.edu">tltamar@stanford.edu</a>	166, 185
Lamb, John H.	<i>The University of Texas, Tyler</i>	<a href="mailto:jlamb@uttyler.edu">jlamb@uttyler.edu</a>	49, 76
LaRochelle, Raymond	<i>University of Delaware</i>	<a href="mailto:rlaroch@udel.edu">rlaroch@udel.edu</a>	103, 144
Lawler, Brian R.	<i>Kennesaw State University</i>	<a href="mailto:blawler4@kennesaw.edu">blawler4@kennesaw.edu</a>	92, 133
Layton, Rebecca Doty	<i>University of Tennessee, Knoxville</i>	<a href="mailto:rdoty1@vols.utk.edu">rdoty1@vols.utk.edu</a>	128
Leaf, Abi	<i>Escondido Union High School District</i>	<a href="mailto:aleaf@euhsd.org">aleaf@euhsd.org</a>	92
Leatham, Keith Rigby	<i>Brigham Young University</i>	<a href="mailto:kleatham@mathed.byu.edu">kleatham@mathed.byu.edu</a>	117, 139, 177
Lee, Hwa Young	<i>Texas State University</i>	<a href="mailto:hylee@txstate.edu">hylee@txstate.edu</a>	69, 79
Lee, Jean S.	<i>University of Indianapolis</i>	<a href="mailto:jslee@uindy.edu">jslee@uindy.edu</a>	40
Lee, Mi Yeon	<i>Arizona State University</i>	<a href="mailto:mlee115@asu.edu">mlee115@asu.edu</a>	6, 155
Leshin, Miriam Simone	<i>Stanford University</i>	<a href="mailto:mleshin@stanford.edu">mleshin@stanford.edu</a>	185
Lesseig, Kristin	<i>Washington State University, Vancouver</i>	<a href="mailto:kristin.lesseig@wsu.edu">kristin.lesseig@wsu.edu</a>	105, 150

Lewis, Jennifer M.	<i>Wayne State University</i>	<a href="mailto:jmlewis@wayne.edu">jmlewis@wayne.edu</a>	8
Liebars, Cathy S.	<i>The College of New Jersey</i>	<a href="mailto:liebars@tcnj.edu">liebars@tcnj.edu</a>	2
Lin, Hochieh	<i>The Ohio State University</i>	<a href="mailto:lin.2532@osu.edu">lin.2532@osu.edu</a>	117
Lischka, Alyson E.	<i>Middle Tennessee State University</i>	<a href="mailto:alyson.lischka@mtsu.edu">alyson.lischka@mtsu.edu</a>	25, 59
Litke, Erica G.	<i>University of Delaware</i>	<a href="mailto:litke@udel.edu">litke@udel.edu</a>	106
Liu, Jinqing	<i>Indiana University, Bloomington</i>	<a href="mailto:jinqliu@iu.edu">jinqliu@iu.edu</a>	24
Livers, Stefanie D.	<i>Missouri State University</i>	<a href="mailto:stefanielivers@missouristate.edu">stefanielivers@missouristate.edu</a>	154
Lloyd, Gwendolyn	<i>Pennsylvania State University</i>	<a href="mailto:lloyd@psu.edu">lloyd@psu.edu</a>	47
Lochard, Alicia	<i>University of Pennsylvania</i>	<a href="mailto:lochard@sas.upenn.edu">lochard@sas.upenn.edu</a>	109
LopezLeiva, Carlos A.	<i>University of New Mexico</i>	<a href="mailto:callopez@unm.edu">callopez@unm.edu</a>	22, 36
Louie, Nicole L.	<i>University of Wisconsin, Madison</i>	<a href="mailto:nlouie@wisc.edu">nlouie@wisc.edu</a>	60
Lucas, Carol	<i>University of Central Oklahoma</i>	<a href="mailto:clucas@uco.edu">clucas@uco.edu</a>	37
Luebeck, Jennifer	<i>Montana State University</i>	<a href="mailto:jennifer.luebeck@montana.edu">jennifer.luebeck@montana.edu</a>	1
Lynch, Sararose	<i>Westminster College</i>	<a href="mailto:lynchsd@westminster.edu">lynchsd@westminster.edu</a>	83, 117
<b>M</b>			
MacDonald, Beth L.	<i>Utah State University</i>	<a href="mailto:beth.macdonald@usu.edu">beth.macdonald@usu.edu</a>	89, 134
Madis, Carlee Elizabeth	<i>Western Michigan University</i>	<a href="mailto:carlee.e.hollenbeck@wmich.edu">carlee.e.hollenbeck@wmich.edu</a>	27
Magiera, Marta T.	<i>Marquette University</i>	<a href="mailto:marta.magiera@marquette.edu">marta.magiera@marquette.edu</a>	117
Makowski, Martha	<i>The University of Alabama</i>	<a href="mailto:mbmakowski@ua.edu">mbmakowski@ua.edu</a>	19
Males, Joshua R.	<i>Lincoln Public Schools</i>	<a href="mailto:joshmales@gmail.com">joshmales@gmail.com</a>	162
Males, Lorraine M.	<i>University of Nebraska, Lincoln</i>	<a href="mailto:lmales2@unl.edu">lmales2@unl.edu</a>	59, 94
Mallam, Winifred	<i>Texas Woman's University</i>	<a href="mailto:wmallam@twu.edu">wmallam@twu.edu</a>	194
Malzahn, Kristen	<i>Horizon Research, Inc.</i>	<a href="mailto:kmalzahn@horizon-research.com">kmalzahn@horizon-research.com</a>	42
Mangram, Charmaine	<i>University of Hawaii</i>	<a href="mailto:cmangram@hawaii.edu">cmangram@hawaii.edu</a>	85
Manouchehri, Azita	<i>The Ohio State University</i>	<a href="mailto:manouchehri.1@osu.edu">manouchehri.1@osu.edu</a>	1
Marin, Katherine Ariemma	<i>Stonehill College</i>	<a href="mailto:kmarin@stonehill.edu">kmarin@stonehill.edu</a>	80, 117
Marmur, Ofer	<i>Simon Fraser University</i>	<a href="mailto:omarmur@sfu.ca">omarmur@sfu.ca</a>	6
Marshall, Anne Marie	<i>Lehman College</i>	<a href="mailto:anne.marshall@lehman.cuny.edu">anne.marshall@lehman.cuny.edu</a>	159, 196
Martin, Kristi R.	<i>North Carolina State University</i>	<a href="mailto:kmartin8@ncsu.edu">kmartin8@ncsu.edu</a>	117
Martin, Stephanie	<i>University of Rochester</i>	<a href="mailto:smartin@warner.rochester.edu">smartin@warner.rochester.edu</a>	102
Martin, Tami	<i>Illinois State University</i>	<a href="mailto:tsmartin@ilstu.edu">tsmartin@ilstu.edu</a>	62
Martin, W. Gary	<i>Auburn University</i>	<a href="mailto:martiwg@auburn.edu">martiwg@auburn.edu</a>	23, 193
Matyska, Rob	<i>Indiana University</i>	<a href="mailto:matyskar@iu.edu">matyskar@iu.edu</a>	117
McCloskey, Andrea	<i>Pennsylvania State University</i>	<a href="mailto:avm11@psu.edu">avm11@psu.edu</a>	196
McCulloch, Allison	<i>University of North Carolina, Charlotte</i>	<a href="mailto:amccul11@uncc.edu">amccul11@uncc.edu</a>	78, 139
McGraw, Rebecca	<i>The University of Arizona</i>	<a href="mailto:rmcgraw@math.arizona.edu">rmcgraw@math.arizona.edu</a>	34, 58
McMahon, Darcy	<i>Michigan Department of Education</i>	<a href="mailto:mcmahond2@michigan.gov">mcmahond2@michigan.gov</a>	124
McMillan, Brandon	<i>University of California, Los Angeles</i>	<a href="mailto:brandon.g.mcmillan@gmail.com">brandon.g.mcmillan@gmail.com</a>	46
McNally, Jennifer	<i>Curry College</i>	<a href="mailto:jmcnally@curry.edu">jmcnally@curry.edu</a>	91
McNamara, Julie	<i>California State University, East Bay</i>	<a href="mailto:julie.mcnamara@csueastbay.edu">julie.mcnamara@csueastbay.edu</a>	181
Meiners, Amanda	<i>University of Iowa</i>	<a href="mailto:amanda-meiners@uiowa.edu">amanda-meiners@uiowa.edu</a>	186
Melville, Matthew	<i>University of Delaware</i>	<a href="mailto:melbob@udel.edu">melbob@udel.edu</a>	91
Miller, Catherine	<i>University of Northern Iowa</i>	<a href="mailto:catherine.miller@uni.edu">catherine.miller@uni.edu</a>	161
Miller, Emily	<i>West Chester University</i>	<a href="mailto:emiller@wcupa.edu">emiller@wcupa.edu</a>	56
Molitoris Miller, Susanna	<i>Kennesaw State University</i>	<a href="mailto:smolitor@kennesaw.edu">smolitor@kennesaw.edu</a>	127
Mortimer, Jillian Peterson	<i>University of Michigan</i>	<a href="mailto:jbpet@umich.edu">jbpet@umich.edu</a>	72, 166
Morton, Karisma	<i>University of North Texas</i>	<a href="mailto:karisma.morton@unt.edu">karisma.morton@unt.edu</a>	117
Moscatelli, Maria	<i>All Academic</i>	<a href="mailto:mmoscatelli@wsu.edu">mmoscatelli@wsu.edu</a>	173
Moss, Diana L.	<i>Utah State University</i>	<a href="mailto:diana.moss@usu.edu">diana.moss@usu.edu</a>	134, 189
Munson, Jen	<i>Northwestern University</i>	<a href="mailto:jmunson@northwestern.edu">jmunson@northwestern.edu</a>	17
Myers, Marrielle	<i>Kennesaw State University</i>	<a href="mailto:mmyers22@kennesaw.edu">mmyers22@kennesaw.edu</a>	84, 143
<b>N</b>			
Nabours, Gina Marie	<i>Northern Arizona University</i>	<a href="mailto:gina.nabours@gmail.com">gina.nabours@gmail.com</a>	150
Naresh, Nirmala	<i>University of North Texas</i>	<a href="mailto:nirmala.naresh@unt.edu">nirmala.naresh@unt.edu</a>	118
Neihaus, Aubrey	<i>The University of Arizona</i>	<a href="mailto:aneihaus@gmail.com">aneihaus@gmail.com</a>	3, 34
Neil, Bisola	<i>Bank Street College of Education</i>	<a href="mailto:bneil@bankstreet.edu">bneil@bankstreet.edu</a>	141
Nielsen, Porter	<i>Brigham Young University</i>	<a href="mailto:porternielsen@gmail.com">porternielsen@gmail.com</a>	53
Nirode, Wayne	<i>Miami University</i>	<a href="mailto:nirodew@miamioh.edu">nirodew@miamioh.edu</a>	33, 54
Nitta, Kathleen	<i>Gonzaga University</i>	<a href="mailto:nitta@gonzaga.edu">nitta@gonzaga.edu</a>	173
Noblitt, Bethany	<i>Northern Kentucky University</i>	<a href="mailto:noblittb@nku.edu">noblittb@nku.edu</a>	120
Novak, Jodie	<i>University of Northern Colorado</i>	<a href="mailto:jodie.novak@unco.edu">jodie.novak@unco.edu</a>	63

**O**

O'Kelley, Sharon K.	<i>Francis Marion University</i>	sokelley@fmarion.edu	155
Olanoff, Dana	<i>Widener University</i>	dolanoff@widener.edu	26, 116
Oloff-Lewis, Jennifer	<i>California State University, Chico</i>	joloff-lewis@csuchico.edu	175
Olson, Travis Austin	<i>University of Nevada, Las Vegas</i>	travis.olson@unlv.edu	61, 140
Orr, Sheila	<i>Michigan State University</i>	sheilafrerixon@gmail.com	156
Orrill, Chandra	<i>University of Massachusetts, Dartmouth</i>	corrill@umassd.edu	116
Ortiz, Nickolaus A.	<i>Michigan State University</i>	ortizni2@msu.edu	73
Osibodu, Molade	<i>Michigan State University</i>	mosibodu@msu.edu	97
Ozgun-Koca, S. Asli	<i>Wayne State University</i>	aokoca@wayne.edu	8
Ozturk, Ayse	<i>The Ohio State University</i>	ozturk.25@osu.edu	1, 171

**P**

Parise Schmidt, Megan	<i>University of Minnesota</i>	pari0071@umn.edu	153
Park, Hyejin	<i>Marquette University</i>	hyejin.park@marquette.edu	117
Parrish, Christopher W.	<i>University of South Alabama</i>	parrish@southalabama.edu	52
Patterson, Cody L.	<i>Texas State University</i>	codypattersonmath@gmail.com	64
Peters, Susan A.	<i>University of Louisville</i>	s.peters@louisville.edu	11
Peterson, Blake E.	<i>Brigham Young University</i>	peterson@mathed.byu.edu	27, 177
Pinter, Holly Henderson	<i>Western Carolina University</i>	hhpinter@wcu.edu	83, 101
Pitvorec, Kathleen	<i>University of Illinois, Chicago</i>	kapitvor@uic.edu	15, 190
Poling, Lisa	<i>Appalachian State University</i>	polingll@appstate.edu	10, 32
Prasad, Priya Vinata	<i>The University of Texas, San Antonio</i>	priya.prasad@utsa.edu	26, 118
Przybyla-Kuchek, Julia	<i>University of Georgia</i>	juliapk@uga.edu	67

**R**

Rassi, Darl	<i>Olivet Nazarene University</i>	dsrassi@olivet.edu	133
Raygoza, Mary Candace	<i>Saint Mary's College of California</i>	mcr13@stmarys-ca.edu	59, 87
Raymond, Kate M.	<i>University of Oklahoma</i>	kate.m.raymond@ou.edu	165
Reed, Samuel Douglas	<i>Middle Tennessee State University</i>	sdr4m@mtmail.mtsu.edu	78, 139
Reeder, Stacy	<i>University of Oklahoma</i>	reeder@ou.edu	47
Reinholz, Daniel Lee	<i>San Diego State University</i>	daniel.reinholz@sdsu.edu	106
Reinke, Luke T.	<i>University of North Carolina, Charlotte</i>	lreinke@unc.edu	65
Reiten, Lindsay	<i>University of Northern Colorado</i>	lindsay.reiten@unco.edu	152
Remillard, Janine	<i>University of Pennsylvania</i>	janiner@upenn.edu	39
Rendon, Sharon	CPM	sharonrendon@cpm.org	188
Rhine, Steve	<i>Pacific University</i>	steverhine@pacificu.edu	20
Rice, Courtney	<i>Pennsylvania State University</i>	c.lynn.rice@gmail.com	47
Richardson, Sandra	<i>National Science Foundation</i>	srichard@nsf.gov	112
Richardson, Sue Ellen	<i>Purdue University</i>	richa114@purdue.edu	172, 192
Rigelman, Nicole	<i>Portland State University</i>	rigelman@pdx.edu	18, 123
Riling, Meghan	<i>Boston University</i>	mriling@bu.edu	126
Ristroph, Ingrid G.	<i>The University of Texas, Austin</i>	ingrid.ristroph@utexas.edu	117
Roller, Sarah A.	<i>The University of Alabama in Huntsville</i>	sarah.roller@uah.edu	80, 117
Roth McDuffie, Amy	<i>Washington State University</i>	mcduffie@wsu.edu	29, 173
Rougee, Annick	<i>Washington State University, TriCities</i>	annick.rougee@wsu.edu	13
Ruef, Jennifer	<i>University of Oregon</i>	jruef@uoregon.edu	82, 152
Ruk, Joshua Michael	<i>Western Michigan University</i>	jzf5431@wmich.edu	27

**S**

Sachs, Deb	<i>University of Indianapolis</i>	dsachs@uindy.edu	40
Saclarides, Evthokia Stephanie	<i>The University of Alabama</i>	essaclarides@ua.edu	95
Sahin, Nesrin	<i>University of Central Arkansas</i>	nesrins@uca.edu	117
Salazar, Fany	<i>The University of Arizona</i>	fanyasalazar@email.arizona.edu	191
Sanchez, Wendy Burleson	<i>Kennesaw State University</i>	wsanchez@kennesaw.edu	141
Sanjari, Azin	<i>Arkansas Tech University</i>	ssanjari@atmu.edu	1
Satyam, V. Rani	<i>Virginia Commonwealth University</i>	vrsatyam@vcu.edu	88
Schack, Edna O'Brien	<i>Morehead State University</i>	e.schack@moreheadstate.edu	133
Scroggins, Ashley Danielle	<i>University of Colorado, Boulder</i>	ashley.scroggins@colorado.edu	12
Seago, Nanette	<i>WestEd</i>	nseago@wested.org	102
Sears, Ruthmae	<i>University of South Florida</i>	ruthmaesears@usf.edu	67, 85
Seashore, Kimberly	<i>San Francisco State University</i>	kimseash@sfsu.edu	169
Shah, Meetal	<i>North Carolina State University</i>	mshah2@ncsu.edu	131
Sharpe, Charlotte Dunlap	<i>Syracuse University</i>	cjsharp@sy.edu	83
Shaughnessy, Meghan	<i>University of Michigan</i>	mshaugh@umich.edu	72
Sherman, Diana	<i>Saint Anselm College</i>	disherma@anselm.edu	117
Silverman, Jason	<i>Drexel University</i>	silverman@drexel.edu	195

Simic-Muller, Ksenija	<i>Pacific Lutheran University</i>	<a href="mailto:simicmka@plu.edu">simicmka@plu.edu</a>	169, 184
Simpson, Amber	<i>Binghamton University, SUNY</i>	<a href="mailto:asimpson@binghamton.edu">asimpson@binghamton.edu</a>	172
Skultety, Lisa	<i>University of Central Arkansas</i>	<a href="mailto:lisa.skultety@gmail.com">lisa.skultety@gmail.com</a>	103
Slavit, David	<i>Washington State University, Vancouver</i>	<a href="mailto:dslavit@wsu.edu">dslavit@wsu.edu</a>	150
Smith, Carmen	<i>University of Vermont</i>	<a href="mailto:carmen.smith@uvm.edu">carmen.smith@uvm.edu</a>	185
Smith, Margaret	<i>University of Pittsburgh</i>	<a href="mailto:pegs@pitt.edu">pegs@pitt.edu</a>	164
Smith, Rebecca E.	<i>University of North Alabama</i>	<a href="mailto:rsmith27@una.edu">rsmith27@una.edu</a>	159
Snider, Rachel B.	<i>The College of New Jersey</i>	<a href="mailto:rsnider@umich.edu">rsnider@umich.edu</a>	52
Sokoll, Amy	<i>University of Nebraska, Lincoln</i>	<a href="mailto:asokoll2@huskers.unl.edu">asokoll2@huskers.unl.edu</a>	71
Starks, Rachel	<i>Boston University</i>	<a href="mailto:rnstarks@bu.edu">rnstarks@bu.edu</a>	126, 187
Steinhorn, Charles	<i>Vassar College</i>	<a href="mailto:steinhorn@vassar.edu">steinhorn@vassar.edu</a>	117
Stephan, Michelle	<i>University of North Carolina, Charlotte</i>	<a href="mailto:michelle.stephan@unc.edu">michelle.stephan@unc.edu</a>	21, 163
Stocker, Shari L.	<i>Michigan Technological University</i>	<a href="mailto:stockero@mtu.edu">stockero@mtu.edu</a>	27, 177
Stoehr, Kathleen Jablon	<i>Santa Clara University</i>	<a href="mailto:kstoehr@scu.edu">kstoehr@scu.edu</a>	36, 191
Stone, Jamalee	<i>Black Hills State University</i>	<a href="mailto:jami.stone@bhsu.edu">jami.stone@bhsu.edu</a>	59, 175
Strutchens, Marilyn E.	<i>Auburn University</i>	<a href="mailto:strutme@auburn.edu">strutme@auburn.edu</a>	85
Sugimoto, Amanda T.	<i>Portland State University</i>	<a href="mailto:asugimo2@pdx.edu">asugimo2@pdx.edu</a>	18
Suh, Jennifer M.	<i>George Mason University</i>	<a href="mailto:jsuh4@gmu.edu">jsuh4@gmu.edu</a>	29, 75
Sullivan, Patrick Lane	<i>Missouri State University</i>	<a href="mailto:patrick.sullivan@missouristate.edu">patrick.sullivan@missouristate.edu</a>	59
Sun, Kathy	<i>Santa Clara University</i>	<a href="mailto:ksun@scu.edu">ksun@scu.edu</a>	176
Swarthout, Mary B.	<i>Sam Houston State University</i>	<a href="mailto:swarthout@shsu.edu">swarthout@shsu.edu</a>	135
Swartz, Barbara Ann	<i>McDaniel College</i>	<a href="mailto:bswartz@mcDaniel.edu">bswartz@mcDaniel.edu</a>	7, 179
Sweeny, Shannon P	<i>Northern Arizona University</i>	<a href="mailto:shannon.sweeny@nau.edu">shannon.sweeny@nau.edu</a>	82, 150
Sztajn, Paola	<i>North Carolina State University</i>	<a href="mailto:psztajn@ncsu.edu">psztajn@ncsu.edu</a>	102, 149
<b>T</b>			
Tanck, Hilary	<i>Clemson University</i>	<a href="mailto:htanck@clemson.edu">htanck@clemson.edu</a>	44
Tanner, Amy	<i>Brigham Young University</i>	<a href="mailto:atanner@mathed.byu.edu">atanner@mathed.byu.edu</a>	59
Tavormina, Mary Jo	<i>University of Illinois, Chicago</i>	<a href="mailto:mjtav@uic.edu">mjtav@uic.edu</a>	190
Taylor, Cynthia E.	<i>Millersville University of Pennsylvania</i>	<a href="mailto:cynthia.taylor@millersville.edu">cynthia.taylor@millersville.edu</a>	74
Telese, James Anthony	<i>The University of Texas, Rio Grande Valley</i>	<a href="mailto:james.telese@utrgv.edu">james.telese@utrgv.edu</a>	117
Teuscher, Dawn	<i>Brigham Young University</i>	<a href="mailto:dawn.teuscher@byu.edu">dawn.teuscher@byu.edu</a>	53, 140
Thanheiser, Eva	<i>Portland State University</i>	<a href="mailto:thanheisere@gmail.com">thanheisere@gmail.com</a>	106, 116
Thomas, Amanda	<i>University of Nebraska, Lincoln</i>	<a href="mailto:amanda.thomas@unl.edu">amanda.thomas@unl.edu</a>	71
Thomas, Jonathan	<i>University of Kentucky</i>	<a href="mailto:jonathan.thomas1@uky.edu">jonathan.thomas1@uky.edu</a>	103, 133
Tillema, Erik	<i>Indiana University</i>	<a href="mailto:etillema@indiana.edu">etillema@indiana.edu</a>	147
Tjoe, Hartono	<i>Pennsylvania State University, Berks</i>	<a href="mailto:hht1@psu.edu">hht1@psu.edu</a>	117, 163
Tobias, Jennifer M.	<i>Illinois State University</i>	<a href="mailto:jtobias@ilstu.edu">jtobias@ilstu.edu</a>	116
Toncheff, Mona	<i>NCSM: Leadership in Mathematics Education</i>	<a href="mailto:mona.toncheff@gmail.com">mona.toncheff@gmail.com</a>	38
Turner, Erin E.	<i>The University of Arizona</i>	<a href="mailto:eturner@email.arizona.edu">eturner@email.arizona.edu</a>	29, 114
Turrou, Angela C.	<i>University of California, Los Angeles</i>	<a href="mailto:achan@gseis.ucla.edu">achan@gseis.ucla.edu</a>	46
Tyminski, Andrew	<i>Clemson University</i>	<a href="mailto:amt23@clemson.edu">amt23@clemson.edu</a>	171
<b>U</b>			
Ulrich, Catherine	<i>Virginia Tech</i>	<a href="mailto:culrich@vt.edu">culrich@vt.edu</a>	155
Utley, Juliana	<i>Oklahoma State University</i>	<a href="mailto:juliana.utley@okstate.edu">juliana.utley@okstate.edu</a>	47
<b>V</b>			
Vallines Mira, Raquel	<i>The University of Texas, San Antonio</i>	<a href="mailto:raquel.vallinesmira@utsa.edu">raquel.vallinesmira@utsa.edu</a>	118
van den Kieboom, Leigh A.	<i>Marquette University</i>	<a href="mailto:leigh.vandenkieboom@marquette.edu">leigh.vandenkieboom@marquette.edu</a>	95
van Es, Elizabeth A.	<i>University of California, Irvine</i>	<a href="mailto:evanes@uci.edu">evanes@uci.edu</a>	110, 148
van Ingen, Sarah	<i>University of South Florida</i>	<a href="mailto:vaningen@usf.edu">vaningen@usf.edu</a>	90
Van Zoest, Laura	<i>Western Michigan University</i>	<a href="mailto:laura.vanzoest@wmich.edu">laura.vanzoest@wmich.edu</a>	27, 177
Voogt, Kevin	<i>Michigan State University</i>	<a href="mailto:voogtkev@msu.edu">voogtkev@msu.edu</a>	156, 186
<b>W</b>			
Walkowiak, Temple A.	<i>North Carolina State University</i>	<a href="mailto:tawalkow@ncsu.edu">tawalkow@ncsu.edu</a>	5, 104
Waller, Patrice Parker	<i>California State University, Fullerton</i>	<a href="mailto:pwaller@fullerton.edu">pwaller@fullerton.edu</a>	176
Walters, C. David	<i>Weber State University</i>	<a href="mailto:cdavidwalters@weber.edu">cdavidwalters@weber.edu</a>	48
Warburton, Trevor	<i>Utah Valley University</i>	<a href="mailto:trevor.warburton@uvu.edu">trevor.warburton@uvu.edu</a>	141
Ward, Jennifer	<i>Kennesaw State University</i>	<a href="mailto:ward.jennifer.k@gmail.com">ward.jennifer.k@gmail.com</a>	3
Warshauer, Hiroko K.	<i>Texas State University</i>	<a href="mailto:hw02@txstate.edu">hw02@txstate.edu</a>	64
Watson, Ginger S.	<i>University of Virginia</i>	<a href="mailto:ginger.watson@virginia.edu">ginger.watson@virginia.edu</a>	183
Watson, Lucy	<i>Belmont University</i>	<a href="mailto:lucywatson@gmail.com">lucywatson@gmail.com</a>	76
Weiland, Travis	<i>Appalachian State University</i>	<a href="mailto:weilandtj@appstate.edu">weilandtj@appstate.edu</a>	10, 32
Welder, Rachael M.	<i>Texas A&amp;M University</i>	<a href="mailto:rachael@rachaelwelder.com">rachael@rachaelwelder.com</a>	26, 116
Wessman-Enzinger, Nicole M.	<i>George Fox University</i>	<a href="mailto:nenzinger@georgefox.edu">nenzinger@georgefox.edu</a>	186
Weston, Tracy	<i>Middlebury College</i>	<a href="mailto:tweston@middlebury.edu">tweston@middlebury.edu</a>	107, 157

Wheeler, Ann	Texas Woman's University	<a href="mailto:awheeler2@twu.edu">awheeler2@twu.edu</a>	194
Whipple, Kyle S.	University of Wisconsin, Eau Claire	<a href="mailto:whippkls@uwec.edu">whippkls@uwec.edu</a>	130
White, Dorothy Y.	University of Georgia	<a href="mailto:dywhite@uga.edu">dywhite@uga.edu</a>	133
White, Janet A.	Millersville University	<a href="mailto:jwhite@millersville.edu">jwhite@millersville.edu</a>	66
Wieman, Rob	Rowan University	<a href="mailto:gomathman@yahoo.com">gomathman@yahoo.com</a>	162
Wilkerson, Trena	National Council of Teachers of Mathematics & Baylor University	<a href="mailto:twilkerson@nctm.org">twilkerson@nctm.org</a>	23
Willingham, James Chris	James Madison University	<a href="mailto:willinjc@jmu.edu">willinjc@jmu.edu</a>	82
Wilson, Holt	University of North Carolina, Greensboro	<a href="mailto:phwilson@uncg.edu">phwilson@uncg.edu</a>	121, 182
Wilson, Melody	University of Michigan	<a href="mailto:melody@umich.edu">melody@umich.edu</a>	158
Wohlhuter, Kay A.	University of Minnesota, Duluth	<a href="mailto:kwohlhut@d.umn.edu">kwohlhut@d.umn.edu</a>	135
Wonsavage, F. Paul	University of North Carolina, Greensboro	<a href="mailto:fpwonsav@uncg.edu">fpwonsav@uncg.edu</a>	121
Wood, Marcy B.	The University of Arizona	<a href="mailto:mbwood@email.arizona.edu">mbwood@email.arizona.edu</a>	117, 166
Woods, Dawn	Oakland University	<a href="mailto:dr.dawn.woods@gmail.com">dr.dawn.woods@gmail.com</a>	83, 185
<b>Y</b>			
Yanisko, Emily J.	Urban Teachers, Baltimore	<a href="mailto:eyanisko@gmail.com">eyanisko@gmail.com</a>	31
Yao, Xiangquan	Pennsylvania State University	<a href="mailto:xzy73@psu.edu">xzy73@psu.edu</a>	45
Yeh, Cathery	Chapman University	<a href="mailto:yeh@chapman.edu">yeh@chapman.edu</a>	87
Yoder, Gina Borgioli	Indiana University - Purdue University Indianapolis	<a href="mailto:gbyoder@iupui.edu">gbyoder@iupui.edu</a>	24
<b>Z</b>			
Zambak, Vecihi Serbay	Monmouth University	<a href="mailto:vzambak@monmouth.edu">vzambak@monmouth.edu</a>	45
Zavala, Maria del Rosario	San Francisco State University	<a href="mailto:mza@sfsu.edu">mza@sfsu.edu</a>	22, 60, 169
Zazkis, Rina	Simon Fraser University	<a href="mailto:zazkis@sfu.ca">zazkis@sfu.ca</a>	6
Zelkowski, Jeremy	The University of Alabama	<a href="mailto:jzelkowski@ua.edu">jzelkowski@ua.edu</a>	85, 137
Zimmerman, Stacey C.	University of North Carolina, Greensboro	<a href="mailto:sczimmer@uncg.edu">sczimmer@uncg.edu</a>	182
Zonnefeld, Ryan	Dordt University	<a href="mailto:ryan.zonnefeld@dordt.edu">ryan.zonnefeld@dordt.edu</a>	152
Zonnefeld, Valorie L.	Dordt University	<a href="mailto:valorie.zonnefeld@dordt.edu">valorie.zonnefeld@dordt.edu</a>	152

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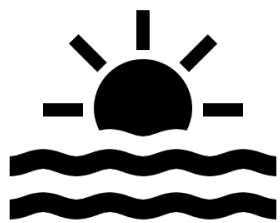
Abbaspour Tazehkand, Shahabeddin	University of Central Florida	Creager, Mark A.	University of Southern Indiana
Allen, Jessica S.	University of South Carolina	DeFino, Rosalie	University of Michigan
Amador, Julie	University of Idaho	Disney, Andria	Georgia Southern University
Apraiz, Kristen	University of Florida	Dobie, Tracy	University of Utah
Arnold, Liz	James Madison University	Dubbs, Christopher	Michigan State University
Atabas, Sebnem	Florida State University	Eddy, Colleen M.	University of North Texas
Aydeniz, Fetiye	Indiana University, Bloomington	Edenfield, Kelly	University of Georgia
Bailey, Nina Gabrielle	University of North Carolina, Charlotte	Edgington, Cyndi	North Carolina State University
Bailey, Pamela R.	Mary Baldwin University	Eli, Jennifer	The University of Arizona
Baldinger, Erin E.	University of Minnesota	Elliott, Lucas	University of Louisville
Barlow, Angela T.	University of Central Arkansas	Elliott, Rebekah	Oregon State University
Bay-Williams, Jennifer	University of Louisville	Enderson, Mary C.	Old Dominion University
Berry, Betsy	Purdue University, Fort Wayne	Farmer, Rachelle Romero	George Mason University
Bharaj, Pavneet Kaur	Indiana University, Bloomington	Foster, Jonathan	University of Georgia
Bolyard, Johnna	West Virginia University	Fox, Ryan David	Belmont University
Bondurant, Liza	Delta State University	Franz, Dana Pomykal	Mississippi State University
Boston, Melissa	Duquesne University	Freeland, Sean	West Virginia University
Bowen, Diana L.	University of Maryland	Gay, Susan	University of Kansas
Bowers, David Matthew	Michigan State University	Gearing, Nicole Venuto	Utah Valley University
Brown, Rachael E.	Pennsylvania State University, Abington	Gerardo, Juan Manuel	The University of Alabama
Burch, Lori	Indiana University	Ghosh Hajra, Sayonita	California State University, Sacramento
Burton, Megan	Auburn University	Gomez Johnson, Kelly	University of Nebraska, Omaha
Carreras-Jusino, Angel	University of Georgia	Gomez, Carlos Nicolas	Clemson University
Cavanna, Jillian M.	University of Hartford	Gonzalez, Monica	East Carolina University
Chandler, Kayla	East Carolina University	Gordon, Evelyn M.	Horizon Research, Inc.
Chesler, Joshua	California State University, Long Beach	Graif, Foster	University of Minnesota
Chiu, Thomas K. F.	The Chinese University of Hong Kong	Grosser-Clarkson, Dana	University of Maryland
Conner, AnnaMarie	University of Georgia	Hallman-Thrasher, Allyson	Ohio University
Cook, Alice L.	Johns Hopkins University	Harbour, Kristin E.	University of South Carolina
Corven, Julien	University of Delaware	Harper, Suzanne R.	Miami University
Costner, Kelly M.	Winthrop University	Hawthorne, Casey W.	Furman University
Cox, Dana C.	Miami University	Hjalmarson, Margret	George Mason University

Hodges, Thomas	<i>University of South Carolina</i>	Patterson, Cody L.	<i>Texas State University</i>
Hoover, Mark	<i>University of Michigan, Ann Arbor</i>	Peters, Susan A.	<i>University of Louisville</i>
Hudson, Rick A.	<i>University of Southern Indiana</i>	Pinchback, Carolyn	<i>University of Central Arkansas</i>
Jacobson, Erik	<i>Indiana University</i>	Pitvorec, Kathleen	<i>University of Illinois, Chicago</i>
Jessup, Naomi	<i>Georgia State University</i>	Poling, Lisa	<i>Appalachian State University</i>
Kar, Avijit	<i>Georgia State University</i>	Powers, Robert	<i>University of Northern Colorado</i>
Karagöz Akar, Gülseren	<i>Boğaziçi University</i>	Pynes, D'Anna	<i>University of Michigan, Ann Arbor</i>
Karr, Josh	<i>West Virginia University</i>	Rahman, Zareen	<i>James Madison University</i>
Kelley, Traci	<i>The University of Texas, San Antonio</i>	Rakes, Christopher	<i>University of Maryland, Baltimore County</i>
King, Nicholas	<i>University of Tennessee</i>	Rassi, Darl	<i>Olivet Nazarene University</i>
Kirwan, J. Vince	<i>Kennesaw State University</i>	Raygoza, Mary Candace	<i>Saint Mary's College of California</i>
Klein, Valerie	<i>Drexel University</i>	Riling, Meghan	<i>Boston University</i>
Knapp, Melinda	<i>Oregon State University, Cascades</i>	Saclarides, Evthokia Stephanie	<i>The University of Alabama</i>
Kulow, Torrey	<i>Portland State University</i>	Safi, Farshid	<i>University of Central Florida</i>
Kurtz, Brianna Ashley	<i>University of Central Florida</i>	Sears, Ruthmae	<i>University of South Florida</i>
LaCroix, Tiffany	<i>Virginia Tech</i>	Shah, Meetal	<i>North Carolina State University</i>
LaRochelle, Raymond	<i>University of Delaware</i>	Sharpe, Charlotte Dunlap	<i>Syracuse University</i>
Leatham, Keith Rigby	<i>Brigham Young University</i>	Sherman, Diana	<i>Saint Anselm College</i>
Lee-Hassan, Alexa W. C.	<i>University of Illinois, Chicago</i>	Simic-Muller, Ksenija	<i>Pacific Lutheran University</i>
Lee, Alees	<i>University of Northern Colorado</i>	Siy, Eric	<i>University of Georgia</i>
Lee, Carrie W.	<i>East Carolina University</i>	Smith, Wendy	<i>University of Nebraska</i>
Liebars, Cathy S.	<i>The College of New Jersey</i>	Snider, Rachel B.	<i>The College of New Jersey</i>
Lin, Hochieh	<i>The Ohio State University</i>	Somers, John W.	<i>University of Indianapolis</i>
Lischka, Alyson E.	<i>Middle Tennessee State University</i>	Stocker, Shari L.	<i>Michigan Technological University</i>
Litke, Erica G.	<i>University of Delaware</i>	Stone, Jamalee	<i>Black Hills State University</i>
LoPresto, Kevin	<i>Francis Marion University</i>	Strickland, Sharon	<i>Texas State University</i>
Lynch, Sararose	<i>Westminster College</i>	Swartz, Barbara Ann	<i>McDaniel College</i>
Madis, Carlee Elizabeth	<i>Western Michigan University</i>	Tanner, Amy	<i>Brigham Young University</i>
Makowski, Martha	<i>The University of Alabama</i>	Tyminski, Andrew	<i>Clemson University</i>
Maldonado, Luz Angelica	<i>Texas State University</i>	Utley, Juliana	<i>Oklahoma State University</i>
Manouchehri, Azita	<i>The Ohio State University</i>	Vargas, Gabriela E.	<i>University of Illinois, Urbana-Champaign</i>
Marin, Katherine Ariemma	<i>Stonehill College</i>	Ward, Jennifer	<i>Kennesaw State University</i>
Marynowski, Richelle	<i>University of Lethbridge</i>	Weiland, Travis	<i>Appalachian State University</i>
Massey, Johanna Lee Fuller	<i>Alabama A&amp;M University</i>	Weston, Tracy	<i>Middlebury College</i>
Matyska, Rob	<i>Indiana University</i>	Whipple, Kyle S.	<i>University of Wisconsin, Eau Claire</i>
McCloskey, Andrea	<i>Pennsylvania State University</i>	White, Dorothy Y.	<i>University of Georgia</i>
McGraw, Rebecca	<i>The University of Arizona</i>	Wilburne, Jane	<i>Pennsylvania State University, Harrisburg</i>
Merritt, Monica	<i>Mount Saint Mary College</i>	Wilson, Holt	<i>University of North Carolina, Greensboro</i>
Miller, Erica Rose	<i>Virginia Commonwealth University</i>	Wonsavage, F. Paul	<i>University of North Carolina, Greensboro</i>
Moldavan, Alesia Mickle	<i>Fordham University</i>	Woods, Dawn	<i>Oakland University</i>
Morgan, Michelle A.	<i>Western Colorado University</i>	Yao, Xiangquan	<i>Pennsylvania State University</i>
Moss, Diana L.	<i>Utah State University</i>	Yoder, Gina Borgioli	<i>Indiana University - Purdue University</i>
Myers, Marrielle	<i>Kennesaw State University</i>	<i>Indianapolis</i>	
Nirode, Wayne	<i>Miami University</i>	Zambak, Vecihi Serbay	<i>Monmouth University</i>
Olanoff, Dana	<i>Widener University</i>	Zbiek, Rose Mary	<i>Pennsylvania State University</i>
Ozturk, Ayse	<i>The Ohio State University</i>	Zelkowski, Jeremy	<i>The University of Alabama</i>
Park, Hyejin	<i>Marquette University</i>	Zhang, Yu	<i>University of Southern California</i>
Parrish, Christopher W.	<i>University of South Alabama</i>		

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- AMTE Leadership, including members serving on committees and task forces
- AMTE Awards, including the Excellence in Mathematics Teacher Education Awards and the Early Career Award
- Susan Gay Graduate Student Conference Travel Scholarship
- Elementary Mathematics Specialist (EMS) Scholarship
- Call for Manuscripts, Reviewers, Readers, & Comments for *CITE-Math Journal*
- Call for Manuscripts for *Mathematics Teacher Educator*
- Call for Manuscripts for *Connections*

## 2021 ANNUAL AMTE CONFERENCE



*See you in Orlando*

We invite you to attend and present at the Twenty-Fifth Annual AMTE Conference, to be held **February 11-13, 2021**, at the Rosen Centre Hotel in **Orlando, FL**.

The Call for Proposals will be available on the AMTE website ([amte.net](http://amte.net)) by March 1, 2020, and in the next issue of *AMTE Connections*. The Program Chair is Rick Hudson, University of Southern Indiana ([programchair@amte.net](mailto:programchair@amte.net)).

**THE DEADLINE FOR SUBMITTING PROPOSALS  
FOR THE 2021 ANNUAL CONFERENCE IS MAY 15, 2020.**

Visit [amte.net/conferences](http://amte.net/conferences) for updated information about past and future conferences.

## FUTURE AMTE CONFERENCES

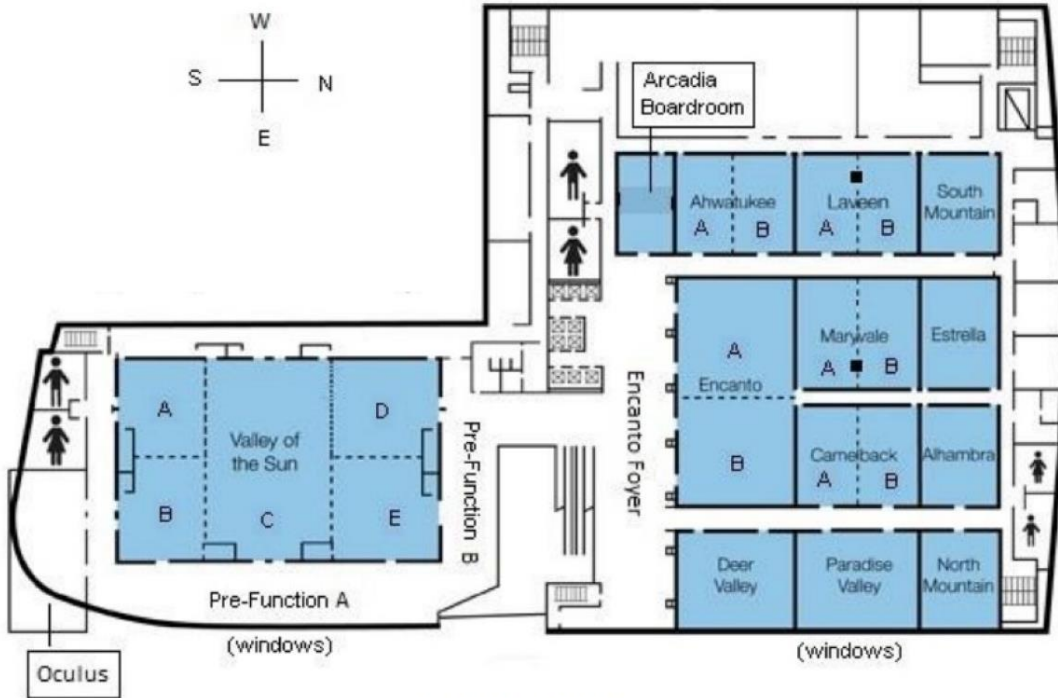
2021 AMTE Conference	Rosen Centre Orlando Orlando, FL	February 11 – 13, 2021
2022 AMTE Conference	Hilton Las Vegas Resort & Spa Las Vegas, NV	February 10 – 12, 2022
2023 AMTE Conference	Crowne Plaza New Orleans French Quarter New Orleans, LA	February 2 – 4, 2023



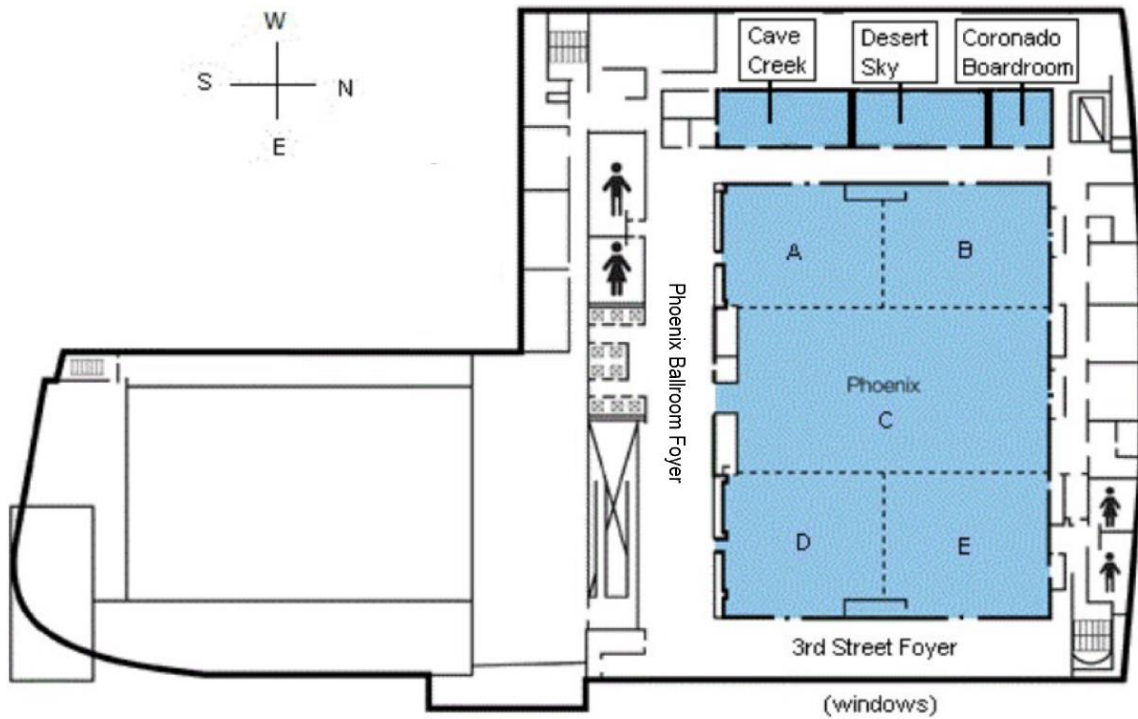


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