



Association of Mathematics Teacher Educators



TWENTY-FOURTH ANNUAL AMTE CONFERENCE

2020

FEBRUARY 6 - 8, 2020

SHERATON PHOENIX DOWNTOWN HOTEL
PHOENIX, ARIZONA

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WELCOME

Welcome to the Twenty-Fourth Annual Conference of the Association of Mathematics Teacher Educators (AMTE)! We are excited to have you join us for the first time here in Phoenix for an exciting three days of professional learning and growth. You may notice a common theme at our conference this year of looking ahead to the future. In our opening plenary session, we've invited forward-thinking voices to push our thinking about the field of mathematics teacher education and what AMTE's role will be in it. Organizationally, we are embarking for the first time in long-term planning as a board and as a part of that, we will be inviting you to share your thoughts on where AMTE should go in the next 5-10 years. Look for a variety of different opportunities to help us think about the future of AMTE, both in our physical spaces and in the app! Whether it's your first time attending the AMTE conference or your twenty-fourth, we hope you find new ideas and engaging conversations in your time with us. Please welcome our first-time attendees to our AMTE family as you encounter them and engage with our Board members and Conference team to share your experiences. We are glad to have you with us this year!

INVITED SPEAKERS AND AWARD SESSIONS

The opening general session, "Looking Down the AMTE Road," is Thursday morning at 8:15 AM in Phoenix D/E. Speakers include:

Kathryn Chval, *University of Missouri*

Carlos Nicolas Gomez, *Clemson University*

Mike Steele, *University of Wisconsin, Milwaukee*

Paola Sztajn gives the 2020 Judith E. Jacobs Lecture, with a talk titled *"Research and Mathematics Teacher Education: Triumphs, Trials, and Transitions"* on Friday afternoon, at 5:00 PM in Phoenix C.

Christopher C. Jett, recipient of the 2019 Early Career Award, will present a talk titled *"Supporting African American Male Mathematics Students: MTEs' High-impact Practices"* on Thursday morning, at 10:45 AM (Session 9) in Maryvale A.

AnnaMarie Conner, recipient of the 2020 Excellence in Scholarship Award, gives a talk titled *"Teacher Support for Argumentation: An Examination of Beliefs and Practice"* on Friday morning, at 8:00 AM (Session 81) in Maryvale A.

Frances K. Harper, Zach Stumbo, and Nick Kim, recipients of the 2020 AMTE NTLI Award, will present a talk based on their paper titled *"When Robots Invade the Neighborhood: Learning to Teach PK-5 Mathematics Leveraging Both Technology and Community Knowledge"* on Friday at 10:15 AM (Session 107) in South Mountain.

PROGRAM INFORMATION

There are 183 sessions and 435 speakers on this year's program. There were 426 proposals submitted for review. The program committee accepted 263 (62%) of these for the program, including: 126 individual presentations, discussion and extended sessions, and symposia; 83 brief reports organized into 32 thematic sessions; and 29 posters for the poster session. The fifth annual AMTE Poster Session is Friday afternoon from 1:00 to 2:00 PM in Phoenix D. The program also includes 10 invited presentations, 3 award-winner sessions, and 4 sessions presented by AMTE sponsors.

LEAD THE WAY

AMTE has grown in scope and influence, and our activities now include co-publishing two journals, publishing books and policy documents, publishing a quarterly newsletter, offering webinars, hosting an active website, administering the STaR program, and working with other professional organizations to provide national leadership. And yet, as much as AMTE offers throughout the year, our conference continues to be a highlight. There really is no substitute for the dynamic quality of sharing and learning with other mathematics teacher educators! Thank you for attending the 2020 AMTE Annual Conference in Phoenix and helping to make this a rich experience.



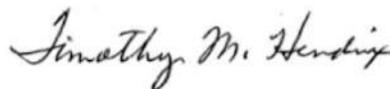
Mike Steele, AMTE President



AnnaMarie Conner, 2020 AMTE AVP for Annual Conference Program



Trena Wilkerson, AMTE AVP for Conferences



Tim Hendrix, AMTE Executive Director

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)
7:00 PM – 9:00 PM Plenary: Continuing the Conversation – Encanto A

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 – Phoenix D & 3rd 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

| | |
|------------------|---------------------------|
| WEDNESDAY | 4:30 PM - 7:30 PM |
| THURSDAY | 7:00 AM - 5:00 PM |
| FRIDAY | 7:30 AM - 4:30 PM |
| SATURDAY | 7:30 AM - 10:30 AM |

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, the members of the Conferences Committee, or hotel staff.

WIRELESS INTERNET ACCESS

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. Complimentary wireless internet access is provided in the conference/meeting area of the hotel for conference attendees and 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**

CANCELLATIONS AND PROGRAM CHANGES

For updated lists of cancellations and other program changes, visit amte.net/conferences/conf2020/updates or the conference app.

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. Vouchers for the discounted parking rate can be picked up at the Registration Desk for attendees who are not staying in the 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. 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 – Mathematics 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 AM

A space for collaboration and informal meetings among conference attendees will be available in the 3rd 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

LIKE AMTE ON FACEBOOK



facebook.com/AMTE.net

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.

AMTE 2019 BOARD OF DIRECTORS

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Michael D. Steele
University of Wisconsin, Milwaukee
Milwaukee, WI
steelem@uwm.edu

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Indiana University
Bloomington, IN
egalindo@indiana.edu

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Baylor University
Waco, TX
sandra_cooper@baylor.edu

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San Diego State University
San Diego, CA
rphilipp@sdsu.edu

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Portland State University
Portland, OR
evat@pdx.edu

TREASURER

Sarah Quebec Fuentes
Texas Christian University
Fort Worth, TX
s.quebec.fuentes@tcu.edu

BOARD MEMBER-AT-LARGE

Christa Jackson
Iowa State University
Ames, IA
jacksonc@iastate.edu

VICE-PRESIDENT OF MEMBERSHIP

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M² Consulting
Louisville, KY
maggiemcgatha87@gmail.com

EXECUTIVE DIRECTOR

Tim Hendrix
Meredith College
Raleigh, NC
hendrixt@meredith.edu

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Sam Houston State University
Huntsville, TX
dustinjones@shsu.edu

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Bucknell University
Bucknell, PA
mbreyfog@bucknell.edu

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California State University, Long Beach
Long Beach, CA
babette.benken@csulb.edu

VICE-PRESIDENT OF ADVOCACY, EQUITY, & RESEARCH

Sarah van Ingen
University of South Florida
Tampa, FL
vaningen@usf.edu

HISTORICAL LISTING OF AMTE PRESIDENTS

| PRESIDENT | TERM | PRESIDENT | TERM |
|-----------------------|-------------|------------------------|-------------|
| Mike Steele | 2019 – 2021 | Karen Karp | 2003 – 2005 |
| Randolph Philipp | 2017 – 2019 | Francis (Skip) Fennell | 2001 – 2003 |
| Christine Thomas | 2015 – 2017 | Susan Gay | 1999 – 2001 |
| Fran Arbaugh | 2013 – 2015 | Nadine Bezuk | 1997 – 1999 |
| Marilyn Strutchens | 2011 – 2013 | Judith Jacobs | 1995 – 1997 |
| Barbara Reys | 2009 – 2011 | Henry Kepner | 1993 – 1995 |
| Jennifer Bay-Williams | 2007 – 2009 | Mark Spikell | 1991 – 1993 |
| Sid Rachlin | 2005 – 2007 | | |

HISTORY OF THE JUDITH E. JACOBS LECTURE

The Judith E. Jacobs Lecture was established in 2003 to honor Dr. Judith E. Jacobs, one of the founding AMTE members. Dr. Jacobs was instrumental in developing AMTE into a national organization and in the development of the AMTE conference with its current structure and emphasis on interaction. Judith Jacobs is an active member who served as treasurer, president, and as the first executive director. The Judith E. Jacobs Lecture was established after Dr. Jacobs completed her tenure as AMTE Executive Director.

Dr. Jacobs gave the first lecture where she described what it means to be a mathematics teacher educator. She outlined how being a mathematics teacher educator is different from being a mathematics teacher, a career professional developer, or a researcher in mathematics education. Dr. Jacobs challenged us to recognize our roles as mathematics teacher educators and reminded us that, through the AMTE organization, an outlet has been created to share and learn from each other.

| YEAR | JUDITH E. JACOBS LECTURER | AFFILIATION | TITLE |
|------|---------------------------|---|--|
| 2020 | Paola Sztajn | North Carolina State University | <i>Research and Mathematics Education: Triumphs, Trials, and Transitions</i> |
| 2019 | Denise A. Spangler | University of Georgia | <i>Fundamental Commitments of My Work as a Mathematics Teacher Educator</i> |
| 2018 | Margaret (Peg) Smith | University of Pittsburgh | <i>A Mathematics Teacher Educator's Journey: Responding to An Evolving Field</i> |
| 2017 | Marilyn E. Strutchens | Auburn University | <i>Attending to Access, Equity, and Empowerment Matters for Each and Every Student: Beyond Courses and Workshops</i> |
| 2016 | Francis (Skip) Fennell | McDaniel College | <i>Mathematics Teacher Education: Normal Schools to Now. What's the Fit and Future for AMTE?</i> |
| 2015 | Nadine Bezuk | San Diego State University | <i>Supporting Elementary Teachers in Developing Their Mathematics Teaching</i> |
| 2014 | Barbara J. Reys | University of Missouri | <i>Curriculum Matters! For Teachers, for Students, and for Mathematics Teacher Educators</i> |
| 2013 | Karen Karp | University of Louisville | <i>The Invisible 10% - Preparing Teachers to Teach Mathematics to Students with Special Needs</i> |
| 2012 | Deborah Schifter | Education Development Center | <i>Interpreting the Common Core: What Might It Look Like in the Classrooms?</i> |
| 2011 | Joan Ferrini-Mundy | Michigan State University | <i>Learning for Tomorrow: Challenges and Opportunities in Mathematics Teacher Education</i> |
| 2010 | James Hiebert | University of Delaware | <i>Building Knowledge for Helping Teachers Learn to Teach: An Alternative Path for Teacher Education</i> |
| 2009 | Jeremy Kilpatrick | University of Georgia | <i>Going to War with the Army You Have</i> |
| 2008 | Ed Silver | University of Michigan | <i>Mathematics Teacher Education in Dodge City: Desperately Seeking Wyatt Earp and Henri Poincaré</i> |
| 2007 | Deborah Loewenberg Ball | University of Michigan | <i>The Core and Contemporary Challenges of Mathematics Teacher Education</i> |
| 2006 | Judith Sowder | San Diego State University | <i>Preparing Elementary Teachers: The Role of Reasoning about Numbers and Quantities</i> |
| 2005 | Glenda Lappan | Michigan State University | <i>Reflections on a Lifetime of Work: Why Curriculum Matters</i> |
| 2004 | Thomas J. Cooney | University of Georgia | <i>The Role of Mathematics Teacher Education: Reform or Enculturation?</i> |
| 2003 | Judith E. Jacobs | California State Polytechnic University, Pomona | <i>Improving Mathematics Education: Mathematics Teacher Educators Lead the Way</i> |

2020 ANNUAL AMTE CONFERENCE COMMITTEE

Associate Vice-President for Conferences: Trena Wilkerson, Baylor University, trena_wilkerson@baylor.edu

Associate Vice-President for Annual Conference Program: AnnaMarie Conner, University of Georgia, aconner@uga.edu

CONFERENCES COMMITTEE

If you have questions, comments, or concerns throughout the conference, please notify one of these members of the Conferences Committee. They will be wearing designated attire and will be happy to assist you.

Tim Hendrix (AMTE Executive Director), Meredith College, hendrixt@meredith.edu

Enrique Galindo (AMTE Board Liaison), Indiana University, egalindo@indiana.edu

Trena Wilkerson, Baylor University, trena_wilkerson@baylor.edu

Colleen Eddy, University of North Texas, Colleen.Eddy@unt.edu

Suzanne Harper, Miami University, harpersr@MiamiOH.edu

Ray LaRochelle, University of Delaware, rlarochel@udel.edu

Lateefah Id-Deen, Kennesaw State University, liddeen@kennesaw.edu

Julie James, University of Mississippi, jjames1@olemiss.edu

ANNUAL CONFERENCE PROGRAM COMMITTEE

Program Committee Chairs:

2020 AnnaMarie Conner, University of Georgia, aconner@uga.edu

2019 Dana Cox, Miami University, Dana.Cox@MiamiOH.edu

2021 Rick Hudson, University of Southern Indiana, rhudson@usi.edu

2017 - 2020

Julie Amador, University of Idaho, jamador@uidaho.edu

Jennifer Eli, University of Arizona, jeli@math.arizona.edu

Cathy Liebars, The College of New Jersey, liebars@tcnj.edu

Jane Wilburne, Pennsylvania State University, Harrisburg, jmw41@psu.edu

2018 - 2021

Megan Burton, Auburn University, megan.burton@auburn.edu

Mary Enderson, Old Dominion University, menderso@odu.edu

Thomas Hodges, University of South Carolina, hodgeste@mailbox.sc.edu

Jeremy Zelkowski, University of Alabama, jzelkowski@ua.edu

2019 - 2022

Kelly Costner, Winthrop University, costnerk@winthrop.edu

Rebekah Elliott, Oregon State University, elliottr@science.oregonstate.edu

Carlos Nicolas Gomez, Clemson University, carlos@clemson.edu

Shari Stockero, Michigan Technological University, stockero@mtu.edu

CONFERENCE APP DEVELOPMENT TEAM

App Coordinator: Joe Champion, Website Director, joechampion@boisestate.edu

App Graphics Assets: Tony Nguyen, Webmaster, ttnguyen@meredith.edu

LOCAL ARRANGEMENTS COMMITTEE

Mi Yeon Lee (Co-chair), Arizona State University

Terri Kurz (Co-chair), Arizona State University

William DeLeeuw, Arizona State University

Kyeong Hah Roh, Arizona State University

Carla van de Sande, Arizona State University

Surani Joshua, Arizona State University

Aubrey Neihaus, University of Arizona

AMTE AFFILIATES

AMTE is proud to welcome members of its 25 affiliated organizations:

AFFILIATE

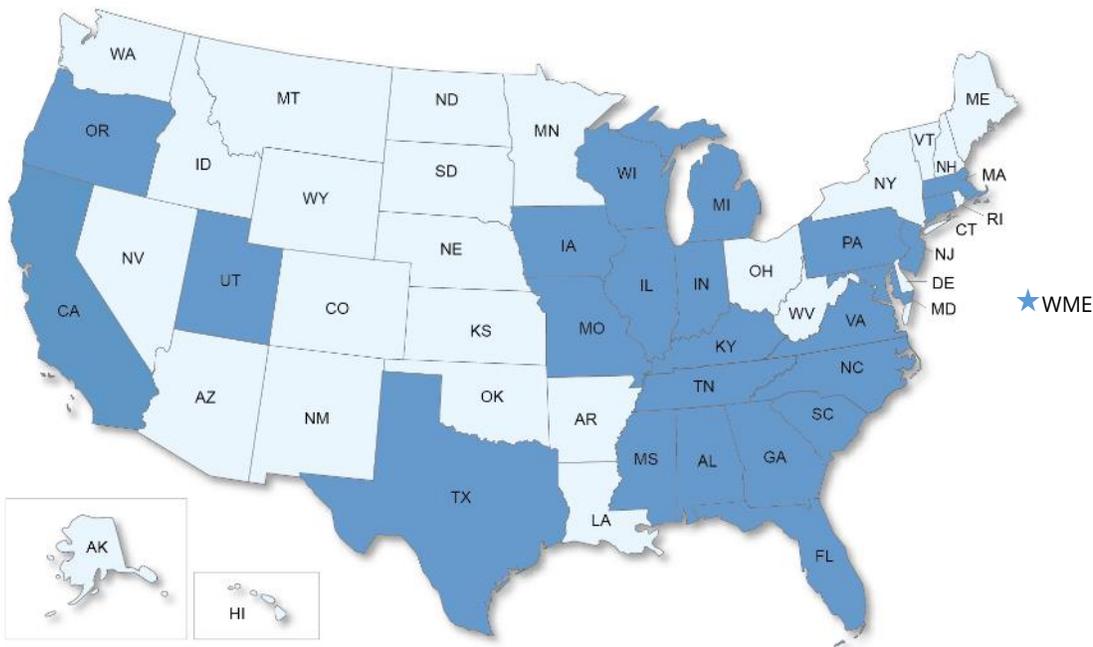
Illinois Mathematics Teacher Educators
 Utah Association of Mathematics Teacher Educators
 Florida Association of Mathematics Teacher Educators
 California Association of Mathematics Teacher Educators
 Association of Mathematics Teacher Educators of Connecticut
 Georgia Association of Mathematics Teacher Educators
 Pennsylvania Association of Mathematics Teacher Educators
 Tennessee Association of Mathematics Teacher Educators
 Massachusetts Mathematics Association of Teacher Educators
 South Carolina Association of Mathematics Teacher Educators
 New Jersey Association of Mathematics Teacher Educators
 Association of Mathematics Teacher Educators of Alabama
 Teachers of Teachers of Mathematics, Oregon
 Association of Mathematics Teacher Educators in Texas
 Mississippi Association of Mathematics Teacher Educators
 Missouri Mathematics Association for Advancement of Teacher Training
 Iowa Association of Mathematics Teacher Educators
 Association of Maryland Mathematics Teacher Educators
 Hoosier Association of Mathematics Teacher Educators
 Association of Mathematics Teacher Educators of North Carolina
 Michigan Association of Mathematics Teacher Educators
 Virginia Association of Mathematics Teacher Educators
 Kentucky Association of Mathematics Teacher Educators
 Wisconsin Association of Mathematics Teacher Educators
 Women and Mathematics Education

ACRONYM

IMTE
 UAMTE
 FAMTE
 CAMTE
 AMTEC
 GAMTE
 PAMTE
 TAMTE
 MassMATE
 SCAMTE
 NJAMTE
 AMTEA
 TOTOM
 AMTE-TX
 MAMTE
 (MAT)^2
 IOWA AMTE
 AMMTE
 HAMTE
 AMTE-NC
 MI-AMTE
 VA-AMTE
 KAMTE
 WI-AMTE
 WME

LOCATION

Illinois
 Utah
 Florida
 California
 Connecticut
 Georgia
 Pennsylvania
 Tennessee
 Massachusetts
 South Carolina
 New Jersey
 Alabama
 Oregon
 Texas
 Mississippi
 Missouri
 Iowa
 Maryland
 Indiana
 North Carolina
 Michigan
 Virginia
 Kentucky
 Wisconsin
 National



The Association of Mathematics Teacher Educators is a member of the Conference Board of the Mathematical Sciences and is an Affiliated Group of the National Council of Teachers of Mathematics.

Are you connected with an AMTE Affiliate? Does your state or regional area have an AMTE Affiliate? There are several opportunities to learn more about AMTE Affiliates during the annual conference.

SATURDAY BREAKFAST AFFILIATE MEETINGS

Saturday, February 8, 6:45 - 7:45 AM, Phoenix C

The special Affiliates breakfast is a great opportunity to meet with colleagues in your region.

WESTERN REGION

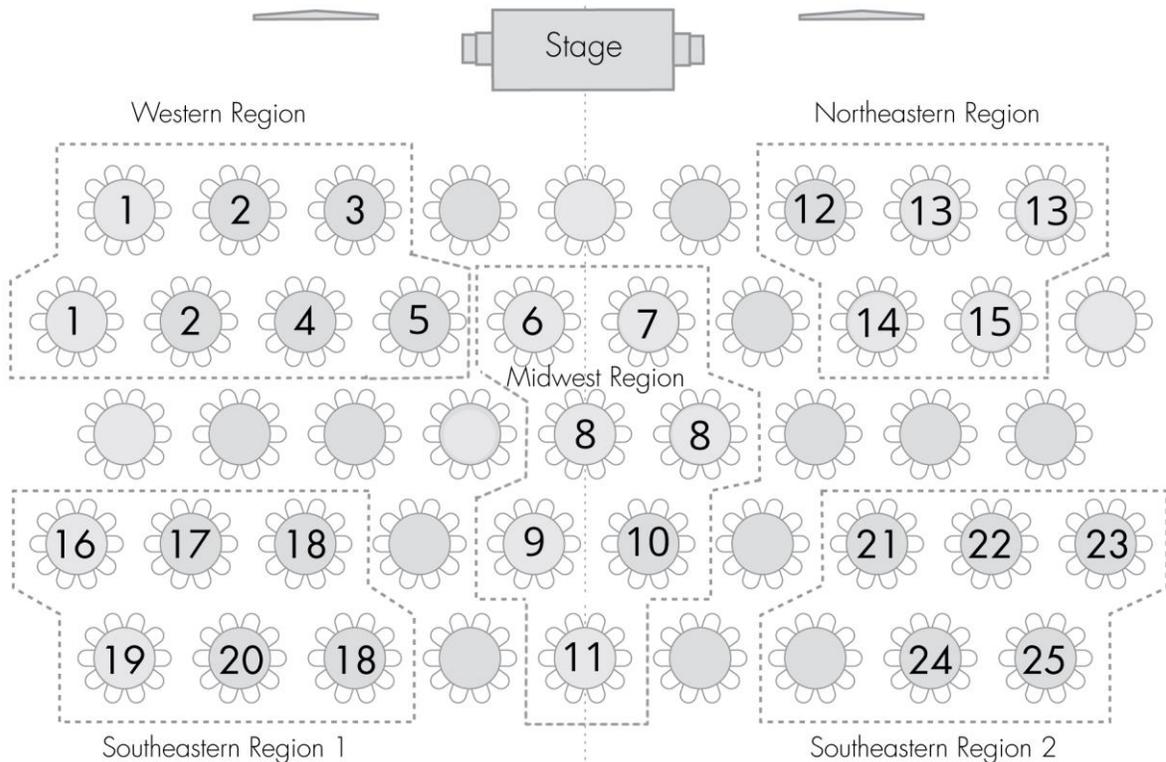
1. CAMTE (California)
2. AMTE-TX (Texas)
3. UAMTE (Utah)
4. TOTOM (Oregon)
5. Women & Mathematics Education

MIDWESTERN REGION

6. IMTE (Illinois)
7. HAMTE (Indiana)
8. MI-AMTE (Michigan)
9. (MAT)² (Missouri)
10. IAMTE (Iowa)
11. WI-AMTE (Wisconsin)

NORTHEASTERN REGION

12. AMTEC (Connecticut)
13. PAMTE (Pennsylvania)
14. MassMATE (Massachusetts)
15. NJAMTE (New Jersey)



SOUTHEASTERN REGION 1

16. AMMTE (Maryland)
17. SCAMTE (South Carolina)
18. AMTE-NC (North Carolina)
19. GAMTE (Georgia)
20. VA-AMTE (Virginia)

SOUTHEASTERN REGION 2

21. FAMTE (Florida)
22. TAMTE (Tennessee)
23. MAMTE (Mississippi)
24. AMTEA (Alabama)
25. KAMTE (Kentucky)

AFFILIATE CONNECTIONS COMMITTEE SESSION

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

Saturday, February 8, 8:00 AM – 9:00 AM, Phoenix B

The purpose of this session is to engage AMTE affiliate leaders and members in a discussion with AMTE Board of Directors to build seamless collaboration. If your state or regional area does not have an AMTE Affiliate and you are interested in organizing one, please contact (amteaffiliate@gmail.com). For more about AMTE Affiliates, please visit at amte.net/affiliates.

THE NTLI AWARD

Since fall 2000, the Society for Information Technology and Teacher Education (SITE) has been collaborating with four teacher education associations representing the content areas of mathematics, science, English language arts, and social studies education through the National Technology Leadership Initiative (NTLI). The NTLI fellowships were established to recognize exemplary presentations related to integration of technology in core content areas at the annual meetings of each participating association. AMTE identifies the winner of its NTLI fellowship through a competitive process that includes the requirement of submitting a paper in advance of the conference. The winner of the award receives travel funding (\$1200, made possible by a donation by Texas Instruments) for presenting at the annual conference of the SITE, and the paper is forwarded and recommended for publication in the CITE journal by the AMTE Technology Committee after additional review. For more information, visit the following website: site.ace.org/awards/awards-ntli.htm. Thanks to Texas Instruments for their ongoing support of this award.

2020 AMTE NTLI AWARD WINNERS

Frances K. Harper, Zach Stumbo, and Nick Kim - University of Tennessee, Knoxville

Session Title: *Leveraging Community Funds of Knowledge to Teach Mathematics with Technology*

Location: Session 107, South Mountain

Time: Friday, February 7, 10:15 - 11:30 AM

Look in the 2021 Call for Proposals for information on how to submit a paper for the 2021 AMTE NTLI Award.

SCHOLARSHIPS FOR ELEMENTARY MATHEMATICS SPECIALISTS

The purpose of this Elementary Mathematics Specialist (EMS) Scholarship is to provide the recipient with \$2,000 of funding to enhance their mathematics knowledge, teaching, and leadership by enrolling in university coursework that will result in becoming a certified elementary mathematics specialist. Elementary mathematics specialists work as teachers, teacher leaders, or coaches and support effective mathematics instruction and student learning at the classroom, school, district, or state levels.

CONGRATULATIONS TO THE 2019 EMS SCHOLARSHIP RECIPIENTS!

Rachel Barrong Aazzerah, Portland, Oregon

MaryBeth Bates, Bennington, Nebraska

Stephanie Casasanta, Orange, Virginia

Check amte.net/about/ems in the spring for information about the next round of EMS Scholarships.

AMTE would like to thank our founding sponsor of the EMS Scholarships:



ACKNOWLEDGEMENTS

The Twenty-Fourth Annual AMTE Conference would not be possible without the contributions and support of many individuals. It is not possible to name each one individually!

AMTE WISHES TO EXPRESS ITS SINCERE APPRECIATION TO THE FOLLOWING:

- The Local Arrangements Committee, especially Mi Yeon Lee and Terri Kurz, Co-chairs, who are critical to making our conference successful;
- All of the speakers who have contributed their time and expertise to make this conference a success;
- The many individuals who make up the AMTE infrastructure – the AMTE Board of Directors, Executive Director, Program Committee, Conferences Committee, Conference App Team, and Headquarters staff for providing the time and effort necessary to organize all facets of the conference;
- Joe Champion, AVP for Website Development, and Tony Nguyen, AMTE Graphic Designer & Webmaster, for their dedicated work on the conference program and materials;
- Mimi Mays, student assistant at Meredith College, and a host of retired teachers for their help with this year's conference preparations;
- Rachel Harlow, Administrative Assistant for AMTE Conferences Committee, for all of her hard work with organizing logistics and details for this year's conference; and
- Susan Gay and Carol Lucas for their guidance and support to the AMTE Conference Committee.

When you see any of these individuals at our AMTE conference, we hope that you will take the time to express your own gratitude for their dedication to the organization and to the success of the 2020 conference.

Thank you!

SPONSORS

AMTE would like to express our appreciation to this year's Sponsors for providing invaluable support for our conference and for our organization's activities and initiatives.

CPM EDUCATIONAL PROGRAM

GOLD SPONSOR

CPM Educational Program is a California nonprofit 501(c)(3) serving the secondary mathematics education community with curriculum, professional development, and leadership. CPM envisions a world where mathematics is viewed as intriguing and useful, and is appreciated by all; where powerful mathematical thinking is an essential, universal, and desirable trait; and where people are empowered by mathematical problem-solving and reasoning to solve the world's problems.

CPM Educational Program is pleased to support AMTE and its STaR program by matching AMTE funds for STaR fellows. The STaR program aligns with CPM's mission to empower mathematics students and foster expertise in teachers as it provides professional development for new math education faculty targeted to help them inspire the next wave of math teachers across the country.

THE MATH LEARNING CENTER

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The Math Learning Center (MLC) offers innovative, standards-based programs for elementary classrooms. *Bridges in Mathematics*, Number Corner, and Bridges Intervention develop mathematical confidence and ability not only in students but also in teachers. In support of our nonprofit mission, we offer a range of free resources, including the Bridges University program, which provides university instructors access to the full contents of the *Bridges in Mathematics* PK–5 curriculum.

MLC is the founding sponsor of the Elementary Mathematics Specialist (EMS) Awards. The recipients of these awards receive funding to enhance their mathematics knowledge, teaching, and leadership by enrolling in university coursework that will result in becoming a certified elementary mathematics specialist.

INFORMATION AGE PUBLISHING – IAP

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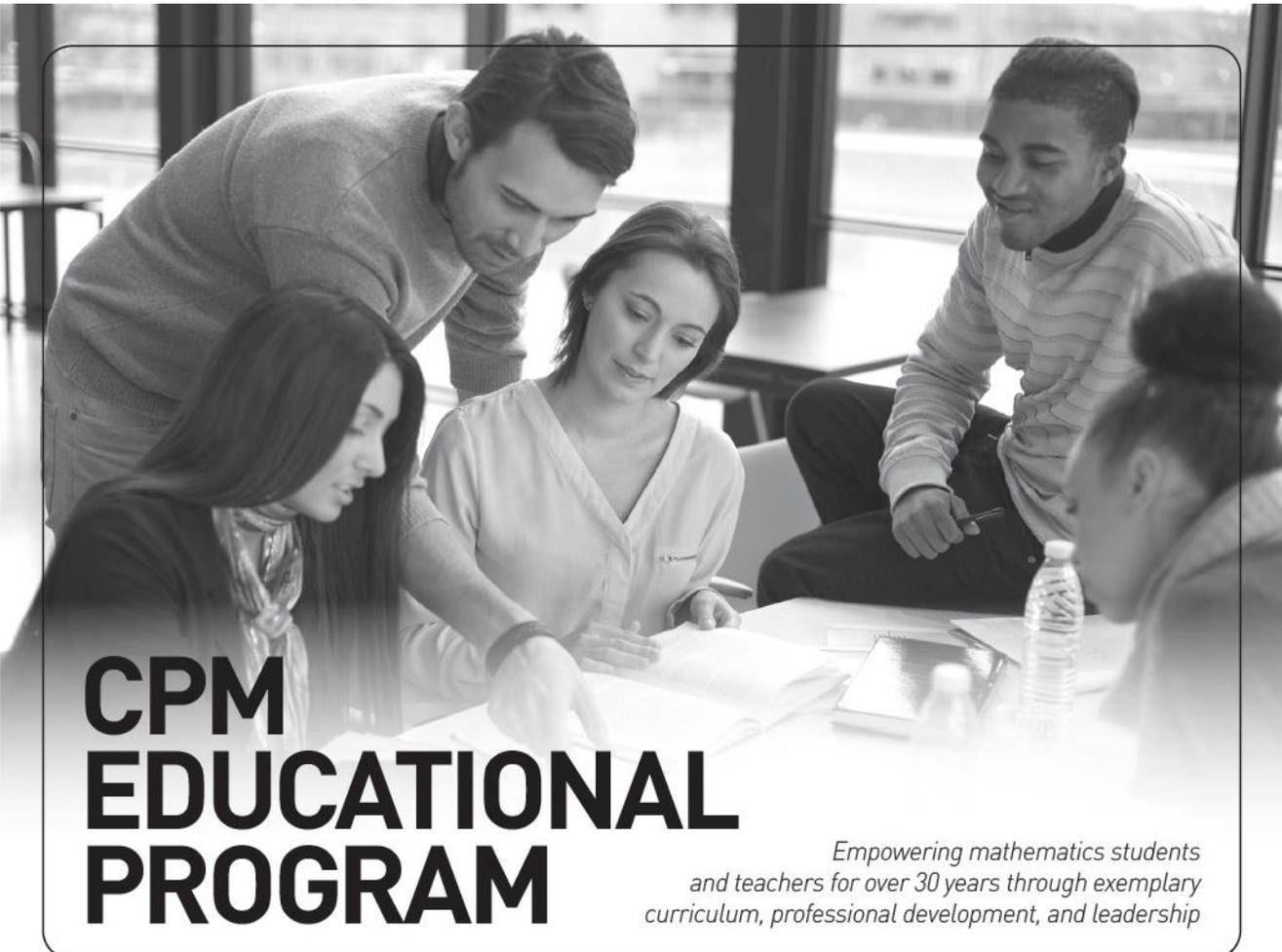
Information Age Publishing – IAP continues to partner with AMTE on multiple projects, including both the republication of the AMTE Monograph Series and the publication of the AMTE Professional Book Series: A four-volume series in the field of mathematics teacher education published over the last three years. AMTE is proud to have IAP as a sponsor. They have provided support for the AMTE Awards, and are donating books as prizes for our Early Career and Graduate Student Reception. Thanks to IAP for their continued support and growing partnership.

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CPM EDUCATIONAL PROGRAM

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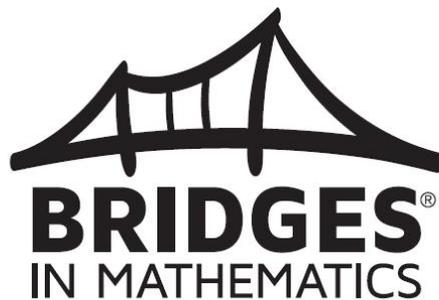


Provide your education students with access to a full PK–5 math curriculum

Bridges University Program

The content of Bridges in Mathematics second edition is now available for free to schools of education. University instructors may request access to the Bridges Educator Site for themselves and for their students. This teacher portal contains a complete set of the teacher and student materials as well as a wealth of resources for implementation support.

mathlearningcenter.org/university



To learn more, please join us for a presentation by
Pamela Weber Harris, Texas State University
Friday, February 7, 9:15–10:00 a.m. in Encanto A
or stop by The Math Learning Center's booth.

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| | <p>Using Classification and Regression Trees: A Practical Primer</p> <p>By: Xin Ma, <i>University of Kentucky</i></p> | | <p>The Mathematics Education of Elementary Teachers: Issues and Strategies for Content Courses</p> <p>Edited by: Lynn C. Hart, <i>Georgia State University, USA</i>; Susan Oesterle, <i>Douglas College, Canada</i>; Susan Swars Auslander, <i>Georgia State University, USA</i>; and Ann Kajander, <i>Lakehead University, Canada</i></p> | | <p>Digital Curricula in School Mathematics</p> <p>Edited by: Meg Bates, <i>The University of Chicago</i>; and Zalman Usiskin, <i>The University of Chicago</i></p> |

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A circular logo with a blue border containing binary code. Inside, it says "NCTM Annual Meeting" at the top, "CENTENNIAL" in a dark blue banner across the middle, and "& Exposition CHICAGO April 1-4, 2020" at the bottom.

**Celebrate
100 years**

**LOOKING BACK AND
MOVING FORWARD**

Join thousands of math education professionals in Chicago as NCTM embarks on its second century. In addition to **compelling sessions**, **networking** opportunities, and the **content** you value, we're planning some **special events and surprises** to mark the occasion.

Registration opens August 1. Learn more at nctm.org/100

➤ #NCTM100

The NCTM logo (an infinity symbol) is on the left. To its right, it says "2020 ANNUAL MEETING & EXPOSITION" in blue and black, and "October 21-24, St. Louis" in black below it.

**Moving Forward —
Kicking off NCTM's
Next 100 Years**

Submissions for the 2020 NCTM Research Conference will open this winter.

NCTM.org/Annual2020
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A colorful illustration featuring various mathematical symbols and tools: a blue equals sign, a green plus sign, a blue minus sign, a yellow pencil, a blue ruler, a green protractor, and a blue hand holding a pencil. The background is a light blue gradient with geometric shapes.

EXHIBITORS

AMTE expresses our appreciation to this year's Exhibitors for providing support for our conference. Stop by the Exhibit area in the Phoenix Ballroom Foyer to see materials from the following exhibitors:

EXHIBITOR

ABOUT THE EXHIBIT

CASIO AMERICA, INC. – CLASSPAD

Casio America, Inc. is a leading manufacturer of education technology. Casio understands the importance of education and strives to provide classroom tools that support the learning process. We offer scientific, graphing, and basic calculators to support all grade levels and mathematical needs.

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CPM Educational Program is a California nonprofit 501(c)(3) empowering mathematics students and teachers through exemplary curriculum, professional development, and leadership. We recognize and foster teacher expertise and leadership in mathematics education. We engage all students in learning mathematics through problem solving, reasoning, and communication. CPM's University Support Program provides complimentary curriculum materials to support preservice teacher candidates, mathematics teacher educators, and mathematics curriculum reviewers and researchers.

GREAT MINDS – EUREKA MATH

Eureka Math (EngageNY Math) builds conceptual understanding to reduce gaps in learning and instill persistence in problem solving, preparing students to understand advanced math, and apply it in the real world. *Eureka Math* is a full solution—a comprehensive PK-12 curriculum, professional development, print materials, digital tools, and support.

INFORMATION AGE PUBLISHING – IAP

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EXHIBITOR

ABOUT THE EXHIBIT

THE MATH LEARNING CENTER

The Math Learning Center (MLC) is a nonprofit organization serving the PK–12 education community. Our mission is to inspire and enable individuals to discover and develop their mathematical confidence and ability. We offer innovative, standards-based resources and professional development. MLC also provides university instructors free access to the full contents of the *Bridges in Mathematics PK–5* curriculum. Stop by our table to learn more about the Bridges University program.

NCSM – LEADERSHIP IN MATHEMATICS EDUCATION

NCSM – Leadership in Mathematics Education is a mathematics education leadership organization that equips and empowers a diverse education community to engage in leadership that supports, sustains, and inspires high-quality mathematics teaching and learning every day for each and every learner. Our bold leadership in the mathematics education community develops vision, ensures support, and guarantees that all students engage in equitable, high-quality mathematical experiences that lead to powerful, flexible uses of mathematical understanding to affect their lives and to improve the world. Stop by for more information about NCSM and our publications and resources, including the NCSM Journal of Mathematics Education Leadership, Position Papers and Publications. Also learn about NCSM partnerships to support Formative Assessment and Digital Learning and about professional learning opportunities scheduled for 2020.

NATIONAL COUNCIL OF TEACHERS OF MATHEMATICS

The National Council of Teachers of Mathematics (NCTM) is the public voice of mathematics education, supporting teachers to ensure equitable mathematics learning of the highest quality through vision, leadership, professional development, and research. NCTM members belong to the largest community of mathematics educators committed to ensuring each and every student has access to the highest quality mathematics teaching and learning. Membership opens doors to classroom resources, professional development opportunities, advocacy, peer-reviewed journals and publications, and an extensive network of teachers and mentors. Learn more about NCTM and the benefits of membership at NCTM.org.

TODOS – MATHEMATICS FOR ALL!

TODOS – Mathematics for ALL is an international professional organization that advocates for equity and high-quality mathematics education for all students - in particular, Latinx students. One of the goals of the organization is to advance educators' knowledge and abilities that lead to implementing an equitable, rigorous, and coherent mathematics program that incorporates the role language and culture play in teaching and learning mathematics. Stop by to hear about the benefits of membership!



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 |
|-----------------------|--|
| Desert Sky | 1. <i>Brief Report Session: Teaching Mathematical Modeling-</i> Luebeck; Asempapa & Alhammouri; Ozturk, Sanjari, & Manouchehri |
| Cave Creek | 2. <i>Simulations in the Elementary Methods Class: Supporting Preservice Teachers in Leading Mathematical Discussions-</i> Liebars & Howell |
| Ahwatukee A | 3. <i>Brief Report Session: Prospective Teachers' Experiences, Stories, and Identities-</i> Davis; Ward; Neihaus |
| Ahwatukee B | 4. <i>Using Student Thinking in Instruction: Leveraging Student Thinking or Endorsing a Particular Method?-</i> Hawthorne & Gruver |
| Laveen A | 5. <i>Designing Teacher Assessments to Improve Feedback for Mathematics Teacher Education-</i> Jacobson, Walkowiak, & Bradshaw |
| Laveen B | 6. <i>Brief Report Session: Prospective Teachers' Knowledge-</i> Marmur & Zazkis; Lee; Hertel |
| South Mountain | 7. <i>Tools to Support Teaching Mathematics Content and Pedagogy Online-</i> Swartz |
| Estrella | 8. <i>Mathematical Tasks as Focus of a Professional Development for Middle School Teachers-</i> Ozgun-Koca, Lewis, & Ferry |
| Maryvale A | 9. <i>Supporting African American Male Mathematics Students: MTEs' High-Impact Practices-</i> Jett 2019 AMTE Early Career Award Winner |
| Maryvale B | 10. <i>Does Place Matter? Implementing a Spatial Justice Framework-</i> Poling & Weiland |
| Encanto A | 11. <i>Facilitating Middle and Secondary Mathematics Teachers' Learning of Statistical Design-</i> Peters |
| Encanto B | 12. <i>Whose "Support Group"?: Negotiating Purpose within Partnership between Mathematics Teacher Researchers and Teacher Educator Researchers-</i> Scroggins, Jackson, & Herbel Eisenmann |
| Phoenix A | 13. <i>Implementing Lessons to Teach Prospective Teachers to Notice High Leverage Practices-</i> Gallagher & Rougee |
| Phoenix B | 14. <i>Teachers' Beliefs About How to Support Students in Making Future Use of their Mathematics Learning-</i> Diamond |
| Phoenix D | 15. <i>A Collaborative Inquiry Model for Teacher Professional Development: A Focus on Formative Assessment and Student Agency-</i> Pitvorec & Castro Superfine |
| Phoenix E | 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 TASKSReuben 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 preservice teachers' knowledge and pedagogical practices in modeling.

PEDAGOGY OF TECHNOLOGY INTEGRATED MATHEMATICAL MODELING INSTRUCTIONAyse 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 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 preservice teachers 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 preservice teachers' stories of learning about equity. The stories' narrative features tell much regarding resources preservice teachers 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: PROSPECTIVE TEACHERS' KNOWLEDGE

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

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.

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**
2019 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**Phoenix A***Mathematics Pedagogy
Discussion Session***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**Phoenix B***Mathematics Content and Curriculum
Individual Session***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**Phoenix D***Professional Development
Individual Session***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**Phoenix E***Collaborations and Partnerships
Individual Session***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.



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

| | 1:15 PM - 2:00 PM | 2:15 PM - 3:00 PM |
|-----------------------|---|--|
| Desert Sky | 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 |
| Cave Creek | 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 |
| Ahwatukee A | 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 |
| Ahwatukee 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 |
| Laveen A | 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 |
| Laveen B | 22. <i>Actions & 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 |
| South Mountain | 29. <i>Defining Core Practices for Mathematical Modeling for Elementary Mathematics Teachers-</i> Suh, Turner, Roth McDuffie, Aguirre, & Birkhead | |
| Estrella | 30. <i>Identifying Initial Recommendations for Infusing Mathematical Writing within Teacher Preparation Programs-</i> Colonnese & Casa | |
| Maryvale A | 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 |
| Maryvale B | 31. <i>But I'm Not Creative Enough! Supporting Novice Teachers: Culturally Relevant Pedagogy and Social Justice Math-</i> Cook & Yanisko | |
| Encanto A | 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 |
| Encanto B | 32. <i>Considering Quantitative, Sociocultural, Spatial, and Critical Ways of Knowing in Preservice Teacher Education-</i> Weiland & Poling | |
| Phoenix A | 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 |
| Phoenix 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 |
| Phoenix D | 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 |
| Phoenix E | 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 |

| | 3:30 PM - 4:30 PM | 4:45 PM - 5:30 PM |
|-----------------------|---|---|
| Desert Sky | 45. <i>Brief Report Session: Teaching Geometry with Technology</i> - Zambak; An; Yao | 61. <i>Geometric Transformations & Desmos: Reflections from a Study on Curricular Reasoning</i> - Shulman & Dingman |
| Cave Creek | 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 |
| Ahwatukee A | 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 |
| Ahwatukee 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 |
| Laveen A | 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 |
| Laveen B | 50. <i>Brief Report Session: Teacher Practice</i> - Cannon; Graif | 66. <i>Brief Report Session: Secondary Teachers' Views of Teacher Preparation</i> - White; Allen |
| South Mountain | 58. <i>Connecting Preservice Teachers' Learning of Mathematics and Pedagogy to Social Justice and Culturally Responsive Teaching</i> - McGraw | |
| Estrella | 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 |
| Maryvale A | 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 |
| Maryvale 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 |
| Encanto A | 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 |
| Encanto 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 |
| Phoenix A | 59. <i>Humanizing Approaches to Grading with Mathematics Pre-Service Teachers: Navigating and Pushing Beyond Systems</i> - Raygoza, Lischka, Tanner, Males, Stone, Harper, & Sullivan | |
| Phoenix B | 60. <i>A Critical Perspective on Equity Pedagogies and Race in Mathematics Education</i> - Louie, Zavala, Dunleavy, Kalinec-Craig, & Bannister | |
| Phoenix D | 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 |
| Phoenix E | 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

*AMTE Sponsor Session***ACTIONS & ACCOUNTABILITY TOWARDS SOCIAL JUSTICE IN MATHEMATICS EDUCATION DE TODOS**Carlos A. Lopez Leiva, 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

*AMTE Sponsor 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 UniversityW. 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 PEDAGOGIESJason Brasel, University of Michigan
Monica Gonzalez, East Carolina University

We describe our efforts to develop and pilot a practical measure to support 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 PROGRAMPamela 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

South Mountain

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

Estrella

*Mathematics Pedagogy**Extended Session***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

Maryvale B

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

Encanto B

*Equity, Social Justice, and Mathematics Teacher Education**Extended Session***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 of 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' ABILITIES 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' abilities 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.

Session 41
Mathematics Pedagogy
Individual Session

Phoenix A

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.

Session 42
Individual Session

Phoenix B

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.

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.

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 internal 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 preservice teachers' 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 preservice teachers' 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 preservice 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.

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 preservice teachers' knowledge of students as learners of mathematics through a series of field-based methods course assignments. Examples from preservice teachers' 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.

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.

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.

BRIEF REPORT SESSION: TEACHER PRACTICE

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.

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.

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.

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 preservice teachers plan to launch a task before in-class peer rehearsals.

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.

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.

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.

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.

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

South Mountain

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

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 preservice teachers' thinking about equity as it relates to written curriculum materials, and consider opportunities to connect the histories of mathematics and education.

Session 59

Phoenix A

*Mathematics Education Policy and Program Issues
Extended Session*

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

Phoenix B

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

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

Desert Sky

*Mathematics Content and Curriculum
Individual Session***GEOMETRIC TRANSFORMATIONS & DESMOS:
REFLECTIONS FROM A STUDY ON CURRICULAR
REASONING**Jonah Shulman, 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

Cave Creek

*Mathematics Pedagogy
Individual Session***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

Ahwatukee A

*Professional Development
Individual Session***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

Ahwatukee B

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

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 empower 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.

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.

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.

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.

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.

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.

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 preservice teachers and highlight the prevalence of descriptions aligned with the professional obligations of mathematics teaching, and those which take precedence after preservice teachers 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.



THURSDAY, FEBRUARY 6, 2020

7:00 PM - 9:00 PM

A M T E

PLENARY: CONTINUING THE CONVERSATION

ENCANTO A

Join representatives from the Opening Session and the AMTE Board of Directors for an informal conversation about the ideas shared and future directions for AMTE. This conversation is an opportunity to share innovative thoughts and ideas to shape the future of AMTE and our priorities in the coming decade.





Conference participants have two options for breakfast.

ADVOCACY AND EMERGING ISSUES BREAKFAST

Julia Aguirre, University of Washington, Tacoma

Cynthia Anhalt, University of Arizona

Toya Frank, George Mason University

Erin Turner, University of Arizona

Amy Roth McDuffie, Washington State University

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

Join colleagues for breakfast and informal conversation.

PHOENIX D



PHOENIX C

OVERVIEW OF FRIDAY MORNING, FEBRUARY 7, 2020

| | 8:00 AM - 9:00 AM | 9:15 AM - 10:00 AM |
|-----------------------|---|---|
| Desert Sky | 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 |
| Cave Creek | 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 |
| Ahwatukee A | 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 |
| Ahwatukee 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 |
| Laveen A | 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 |
| Laveen 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 |
| South Mountain | 87. <i>Teacher and Student Angles: Building a Critical Mathematics Video Repository</i> - Dunleavy, Raygoza, Jessup, Yeh, & Krause | |
| Estrella | 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 |
| Maryvale A | 81. <i>Teacher Support for Argumentation: An Examination of Beliefs and Practice</i> - Conner 2020 AMTE Excellence in Scholarship Award | 96. <i>Preservice Teachers' Views of Mathematics Instruction Mediated by iPads</i> - Barlow & Groves-Scott |
| Maryvale 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, & Cosby |
| Encanto A | 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 |
| Encanto B | 88. <i>Using the Process Writing Model as a Tool for Mathematics Teacher Professional Development</i> - Satyam | |
| Phoenix A | 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 |
| Phoenix B | 85. <i>Collaborating to Improve Clinical Experiences for Secondary Mathematics Teacher Candidates</i> - Strutchens, Sears, Zerkowski, Mangram, & Conway | 100. <i>Engaging Alumni: Linking Longitudinal Research to Program Evaluation and Innovation</i> - Harper & Cox |
| Phoenix E | 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 | |
|----------------------------|---|
| Desert Sky | 102. <i>Scaling Professional Development Programs: Transitioning from Face-to-Face to Online Environments</i> - Sztajn, Carson, Knotts, Carroll, Martin, Alnizami, & Seago |
| Cave Creek | 103. <i>Investigations into Connections between Teachers' Professional Noticing and Teachers' Cognitive Resources: Looking Back and Moving Forward</i> - LaRoche, Dick, Skultety, & Thomas |
| Ahwatukee A | 104. <i>Quantitative Research Instruments Relevant to Mathematics Teacher Educators</i> - Krupa, Bostic, Cavey, Harrell-Williams, Hjalmarson, & Walkowiak |
| Ahwatukee B | 105. <i>Framing and Assessing Mathematical Knowledge for Teaching Proof</i> - Buchbinder, Lesseig, Cirillo, & Hempel |
| Laveen A | 106. <i>Leveraging Diverse Tools to Measure Components of Mathematically Productive Classrooms</i> - Litke, Thanheiser, Heaton, & Reinholz |
| Laveen B | 107. <i>Bringing Teacher Education Outdoors</i> - Weston & Baker |
| South Mountain | 108. <i>Leveraging Community Funds of Knowledge to Teach Mathematics with Technology</i> - Harper & Kim 2020 AMTE NTLI Award Winner |
| Estrella | 109. <i>A Mathematics Selective Alternative Teacher Certification Program (ATCP) for Urban Schools: Trajectories, Preparation, and Consequences</i> - Cooley, Brantlinger, Lochard, Khalil, & Bullock |
| Maryvale A | 110. <i>New Directions for Video-Based Pedagogies to Enhance Teacher Noticing</i> - van Es & Dobie |
| Maryvale B | 111. <i>Strategies for Supporting Technology in Mathematics Teacher Education</i> - AMTE Technology Committee |
| Encanto A | 112. <i>National Science Foundation Proposals for Equity, Diversity, and Inclusion in Mathematics Teacher Education</i> - Richardson |
| Encanto B | 113. <i>Publishing Your Scholarly Work in an AMTE Publication: Opportunities Explored and Questions Answered</i> – AMTE Publications Division |
| Phoenix A | 114. <i>Mathematical Modeling in K-12 Mathematics Teacher Preparation</i> - Aguirre & Turner |
| Phoenix B | 115. <i>I Am New to Mathematics Teacher Education: Realities of Teaching, Scholarship, and Service</i> – AMTE Professional Development Committee |
| Phoenix E | 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.

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.

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 definitions, constructing shapes, and 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 preservice teachers in conversations about whether particular (unconventional) tools are appropriate for measuring angles. We report on preservice teachers' 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.

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 preservice teachers' abilities to attend, interpret, and respond to students' mathematical thinking through the use of photographs. Results indicate preservice teachers' photographs focused on mathematics, but demonstrated strengths and weaknesses in learning progression use.

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.

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).

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 preservice teachers usually navigate alone? Mediated Field Experiences (MFEs) position MTEs to join with preservice teachers in the authentic and worthwhile challenges of providing ambitious and equitable mathematics instruction to K-12 students.

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 Emerging Issues Committee

Engage with Advocacy Breakfast panelists to learn more about issues raised at the breakfast, including how to keep engaged 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

Desert Sky

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

Cave Creek

*Collaborations and Partnerships
Individual Session***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

Ahwatukee A

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

Matthew Melville, University of Delaware

A study was 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 MODELSLaura Callis, Curry College
Jennifer McNally, Curry College

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

Session 92

Ahwatukee B

*Professional Development
Individual Session***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

Laveen A

*Teaching and Learning with Technology
Individual Session***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+); 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

Laveen B

*Mathematics Pedagogy
Individual Session***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 preservice teachers (n=64) in lesson and unit planning. Preliminary results suggest preservice teachers' increased confidence and understanding of big ideas, learning goals, and learning progressions.

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.

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.

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
Missy Cosby, 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.

Session 98

Encanto A

AMTE Sponsor Session

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

Pamela Weber Harris, Texas 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.

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.

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.

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

Desert Sky

*Professional Development
Symposium***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

Cave Creek

*Mathematics Pedagogy
Symposium***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

Ahwatukee A

*Mathematics Education Policy and Program Issues
Symposium***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

Ahwatukee B

*Mathematics Content and Curriculum
Symposium***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 preservice and inservice teachers' MKT-P and discuss affordances and challenges of measuring this specialized teacher knowledge.

Session 106

Laveen A

*Development of Mathematics Teacher Educators
Symposium***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

Laveen B

*Collaborations and Partnerships
Symposium***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

South Mountain

*2020 AMTE NTLI Award***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.

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.

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.

Session 111 Maryvale B
AMTE Committee Session

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.

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.

Session 113 Encanto B
AMTE Committee Session

PUBLISHING YOUR SCHOLARLY WORK IN AN AMTE PUBLICATION: OPPORTUNITIES EXPLORED AND QUESTIONS ANSWERED

AMTE Publications Division

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.

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.

Session 115 Phoenix B
AMTE Committee Session

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.

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&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.

PHOENIX C

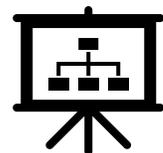


POSTER SESSION

Join us for the 5th Annual AMTE Poster Session. The Poster Session is intended to facilitate sharing information and research through a visual display of material. This session allows an opportunity for informal discussions and interactions between the presenter(s) and the audience. Please note the set-up, viewing, and take-down times outlined below.

9:00 AM – 11:00 AM
11:00 AM – 1:00 PM
1:00 PM – 2:00 PM
2:00 PM – 2:30 PM

Presenters set up posters
Posters available for viewing
Poster presentations
Presenters remove posters



PHOENIX D

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

Farshid Safi, 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 preservice teachers' 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 preservice teachers with conferences during coursework, including our virtual conference assignment and data evaluating the conference experience for preservice teachers. Results indicate conference experiences influenced preservice teachers' 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

AMTE STaR Program Committee

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 preservice 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 preservice 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 preservice 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 PRESERVICE 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 depicts preliminary results of an ongoing study of perceptions of preservice 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 |
|-----------------------|---|--|
| Desert Sky | 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 |
| Cave Creek | 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 |
| Ahwatukee A | 120. <i>Brief Report Session: Lesson Study</i> - Kasten & Noblitt; Koester | 135. <i>Brief Report Session: Number Talks</i> - Wohlhuter & Swarthout; Kirschner & Baker |
| Ahwatukee 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 |
| Laveen A | 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> -Zelkowski |
| Laveen 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 |
| South Mountain | 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 |
| Estrella | 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, & Shulman |
| Maryvale A | 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 |
| Maryvale 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 |
| Encanto A | 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 |
| Encanto 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 |
| Phoenix A | 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 |
| Phoenix 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 |
| Phoenix D | | 147. <i>Achieving "Strategic Outcomes" through Discrete Mathematics: Developing Content Knowledge, Designing Curriculum, and Addressing Equity Issues</i> - Gatzka, Tillema, & Burch |
| Phoenix E | 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 **Desert Sky**
Mathematics Content and Curriculum
Individual Session

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 preservice teachers 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 **Ahwatukee B**
Mathematics Pedagogy
Individual Session

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 **Laveen A**
AMATYC President Exchange Session

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 **Laveen B**
Practice-Based Experiences for Prospective Teachers
Individual Session

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 preservice 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 preservice teachers' understandings of mathematical mindsets are influenced by using an online gamification tool. Aspects of the online gamification tool that preservice teachers 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

Phoenix B

*Professional Development
Individual Session***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

Phoenix E

*Mathematics Content and Curriculum
Discussion Session***EXAMINING PRESERVICE TEACHERS' BEGINNING PRACTICES OF INTEGRATING THE STANDARDS FOR MATHEMATICAL PRACTICE 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 preservice teachers' practices of integrating SMPs and content standards. Please join us for a productive learning opportunity!



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 preservice 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 preservice teachers. In this session, we describe the ways in which preservice teachers 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 preservice teacher'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 Zekowski, 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.

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 preservice or inservice teachers who aim to design practice-embedded learning experiences that utilize instructional activities (IAs). We examine the critical components of IAs that are productive in supporting mathematics teachers' learning and student learning.

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.

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
Jonah Shulman, 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.

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 Burleson 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 mathematics teachers are caught by responsibility. These discourses lead teachers to locate responsibility elsewhere or enact social justice problematically. I propose a tension (Gutiérrez, 2009) between taking and sharing responsibility.

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.

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 preservice teachers' 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 preservice teachers' 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 Gatza, 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

The presenter 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.



JUDITH E. JACOBS LECTURE

PHOENIX C

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.



RECEPTION FOR ALL CONFERENCE ATTENDEES

PHOENIX D & 3rd STREET FOYER

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





AMTE BREAKFAST AND AFFILIATE MEETINGS

PHOENIX C

Tables will be designated for AMTE Affiliate groups to meet during Saturday morning's breakfast.



WESTERN REGION

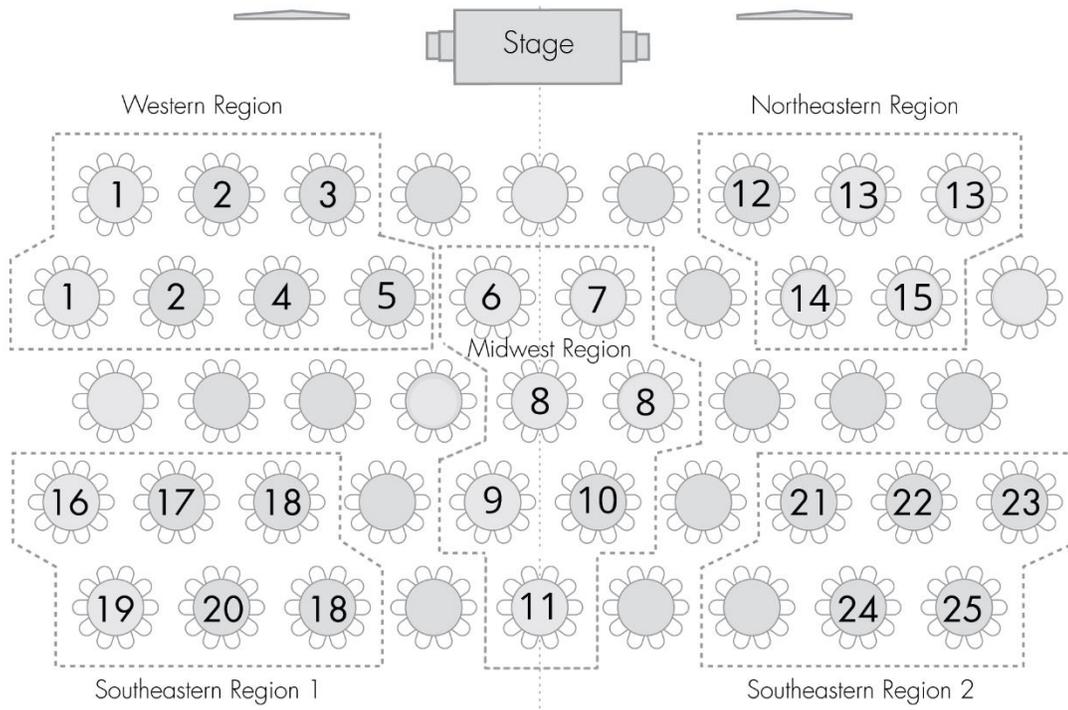
- 1. CAMTE (California)
- 2. AMTE-TX (Texas)
- 3. UAMTE (Utah)
- 4. TOTOM (Oregon)
- 5. Women & Mathematics Education

MIDWESTERN REGION

- 6. IMTE (Illinois)
- 7. HAMTE (Indiana)
- 8. MI-AMTE (Michigan)
- 9. (MAT)^2 (Missouri)
- 10. IAMTE (Iowa)
- 11. WI-AMTE (Wisconsin)

NORTHEASTERN REGION

- 12. AMTEC (Connecticut)
- 13. PAMTE (Pennsylvania)
- 14. MassMATE (Massachusetts)
- 15. NJAMTE (New Jersey)



SOUTHEASTERN REGION 1

- 16. AMMTE (Maryland)
- 17. SCAMTE (South Carolina)
- 18. AMTE-NC (North Carolina)
- 19. GAMTE (Georgia)
- 20. VA-AMTE (Virginia)

SOUTHEASTERN REGION 2

- 21. FAMTE (Florida)
- 22. TAMTE (Tennessee)
- 23. MAMTE (Mississippi)
- 24. AMTEA (Alabama)
- 25. KAMTE (Kentucky)

OVERVIEW OF SATURDAY MORNING, FEBRUARY 8, 2020

| | 8:00 AM - 9:00 AM | 9:15 AM - 10:15 AM |
|-----------------------|--|--|
| Desert Sky | 150. <i>Brief Report Session: Beliefs and Ways of Thinking-</i> Sweeny & Nabours; Slavit & Lesseig | 166. <i>Brief Report Session: Mathematical Practices-</i> LaMar; Mortimer; Wood |
| Cave Creek | 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 |
| Ahwatukee A | 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 |
| Ahwatukee 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 |
| Laveen A | 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 |
| Laveen 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 |
| South Mountain | 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 |
| Estrella | 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 |
| Maryvale A | 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 |
| Maryvale 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 |
| Encanto A | 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 |
| Encanto 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 |
| Phoenix A | 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 |
| Phoenix 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 |
| Phoenix D | 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 |
| Phoenix E | 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

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

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 preservice teachers in developing statistical thinking skills.

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.

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 PATTERNSTerri 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 INSIGHTSSarah 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.

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 preservice teachers 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.

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.

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.

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.

Session 160 **Encanto A**

*Professional Development
Individual Session*

WHY DO YOU ASK...?

Kaili Hardamon, Detroit Public Schools Community District

What impact do 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.

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.

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.

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

AMTE Affiliate Connections Committee
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 AMTE Board of Directors to build seamless collaboration.

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.

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 preservice teachers attended to when developing and implementing number talks as part of a field placement. Participants will analyze changes in the preservice teachers' 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 ISOLATIONAmber 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 YEARSKari 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 TEACHERSMaria 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.

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.

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.

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, Washington State University
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.

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.

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 preservice teachers engaged in our module across our institutions, they self-reported beliefs indicating 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.

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.

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.

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.

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.

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

Desert Sky

*Mathematics Content and Curriculum
Individual Session***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

Cave Creek

*Teaching and Learning with Technology
Individual Session***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

Ahwatukee A

*Equity, Social Justice, and Mathematics Teacher Education
Individual Session***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 preservice 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 inservice 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.

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 preservice 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 preservice teachers perceive mistakes.

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 preservice teachers who experienced this curriculum. Session participants will examine the lesson and preservice teachers' work, considering how to support their own preservice teachers in developing understanding of number.

Session 188

South Mountain

AMTE Sponsor 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

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.

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.

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.

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 preservice teachers. Participants will discuss student and preservice teacher 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 preservice teachers 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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| Browning, Christine | <i>Western Michigan University</i> | christine.browning@wmich.edu | 195 |
| Buchbinder, Orly | <i>University of New Hampshire</i> | orly.buchbinder@unh.edu | 94, 105 |
| Buchheister, Kelley | <i>University of Nebraska, Lincoln</i> | kbuchheister2@unl.edu | 71, 74 |
| Bullock, Erika C. | <i>University of Wisconsin, Madison</i> | ecbullock@wisc.edu | 109 |
| Burch, Lori | <i>Indiana University</i> | ljburch@iu.edu | 147 |
| 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> | laura.callis@curry.edu | 91 |
| Candela, Amber Grace | <i>University of Missouri, St. Louis</i> | candela@umsl.edu | 116, 167 |
| Cannon, Susan Ophelia | <i>Mercer University</i> | sosophelia@gmail.com | 50 |
| Capen, Laurie M. | <i>George Mason University</i> | lcapen@gmu.edu | 75 |
| Carroll, Cathy E. | <i>WestEd</i> | ccarrol@wested.org | 102 |
| Carson, Cynthia D. | <i>University of Rochester</i> | cynthiacarson17@gmail.com | 102, 136 |
| Casa, Tutita M. | <i>University of Connecticut</i> | tutita.casa@uconn.edu | 30, 101 |
| Casey, Stephanie | <i>Eastern Michigan University</i> | scasey1@emich.edu | 146, 158 |
| Castro-Minnehan, Cynthia Ann | <i>University of South Florida</i> | ccastrominne@mail.usf.edu | 67, 175 |
| Castro Superfine, Alison | <i>University of Illinois, Chicago</i> | amcastro@uic.edu | 15, 171 |
| Cavanna, Jillian M. | <i>University of Hartford</i> | cavanna@hartford.edu | 101 |
| Cavey, Laurie | <i>Boise State University</i> | lauriecavey@boisestate.edu | 104 |
| Cayton, Charity | <i>East Carolina University</i> | caytonc@ecu.edu | 78, 175 |
| Chandler, Kayla | <i>East Carolina University</i> | chandlerk@ecu.edu | 142 |
| Chao, Theodore | <i>The Ohio State University</i> | chao.160@osu.edu | 196 |
| Chauvot, Jennifer B. | <i>University of Houston</i> | jchauvot@uh.edu | 195 |
| Chavez, Rosa Del Carmen | <i>Stanford University</i> | rdchavez@stanford.edu | 152 |
| Che, S. Megan | <i>Clemson University</i> | sche@clemson.edu | 47 |
| Chen, Lizhen | <i>Purdue University</i> | lizchen@purdue.edu | 192 |
| Chesler, Joshua | <i>California State University, Long Beach</i> | josh.chesler@csulb.edu | 77 |
| Christensen, Sharon | <i>Brigham Young University</i> | sharonc@mathed.byu.edu | 55 |
| Cirillo, Michelle | <i>University of Delaware</i> | mcirillo@udel.edu | 105, 144 |
| Civil, Marta | <i>University of Arizona</i> | civil@math.arizona.edu | 191 |
| Clements, Douglas H. | <i>University of Denver</i> | douglas.clements@du.edu | 193 |
| Cloward, Janessa | <i>Brigham Young University</i> | cloward.janessa@gmail.com | 53 |
| Colonnese, Madelyn | <i>University of North Carolina, Charlotte</i> | mcolonn1@uncc.edu | 30 |
| Conner, AnnaMarie | <i>University of Georgia</i> | aconner@uga.edu | 81 |
| Conway, Basil | <i>Columbus State University</i> | conway_basil@columbusstate.edu | 85 |
| Cook, Alice L. | <i>Johns Hopkins University</i> | cookie.teach@gmail.com | 31 |
| Cooley, Laurel | <i>Brooklyn College, CUNY</i> | lcooley@brooklyn.cuny.edu | 28, 109 |
| Corven, Julien | <i>University of Delaware</i> | jcorven@udel.edu | 171 |
| Cosby, Missy | <i>Michigan State University</i> | mcosby@msu.edu | 97 |
| Cox, Dana C. | <i>Miami University</i> | dana.cox@miamioh.edu | 100 |
| Creager, Mark A. | <i>University of Southern Indiana</i> | macreager@usi.edu | 52 |
| Cullen, Craig | <i>Illinois State University</i> | cjculle@ilstu.edu | 62 |

D

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

E

| | | | |
|--------------------------|---|-------------------------|---------|
| Ebby, Caroline B. | <i>University of Pennsylvania</i> | cbe@upenn.edu | 39 |
| Edenfield, Kelly | <i>University of Georgia</i> | kedenfield@uga.edu | 55 |
| Edwards, Belinda Pickett | <i>Kennesaw State University</i> | bedwards@kennesaw.edu | 36, 141 |
| Enderson, Mary C. | <i>Old Dominion University</i> | menderso@odu.edu | 183 |
| Erickson, Ander | <i>University of Washington, Tacoma</i> | awerick@uw.edu | 19 |
| Eskelson, Samuel L. | <i>University of Northern Iowa</i> | samuel.eskelson@uni.edu | 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> | mfernann@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 | 50 |
| 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 |
| Harris, Pamela Weber | <i>Texas State University</i> | pwh385@txstate.edu | 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 | 6 |
| Hillman, Susan L. | <i>Saginaw Valley State University</i> | shillman@svsu.edu | 25 |
| Hinojosa, Denise 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> | hhowell@ets.org | 2 |
| Hudson, Rick A. | <i>University of Southern Indiana</i> | rhudson@usi.edu | 146 |
| Hughes, Elizabeth | <i>University of Northern Iowa</i> | elizabeth.hughes@uni.edu | 161 |
| Hummel, Robin Ellen | <i>Bank Street College of Education</i> | rhummel@bankstreet.edu | 141 |
| Humphreys, Cathy | <i>Mathematics Education Collaborative</i> | cathy.j.humphreys@gmail.com | 151 |
| I | | | |
| Id-Deen, Lateefah | <i>Kennesaw State University</i> | liddeen@kennesaw.edu | 176 |
| J | | | |
| Jackson, Brent | <i>Michigan State University</i> | bjackson@msu.edu | 12, 97 |
| Jackson, Christa | <i>Iowa State University</i> | jacksonc@iastate.edu | 74, 168 |
| Jacobson, Erik | <i>Indiana University</i> | erdajaco@indiana.edu | 5 |
| Jensen, Jess | <i>California Polytechnic State University, San Luis Obispo</i> | jjense11@calpoly.edu | 56, 65 |
| Jessup, Naomi | <i>Georgia State University</i> | njessup@gsu.edu | 87 |
| Jett, Christopher C. | <i>University of West Georgia</i> | cjett@westga.edu | 9 |
| Johnson, Nicholas Charles | <i>San Diego State University</i> | nicko@ucla.edu | 46 |
| Jones, Dusty | <i>Sam Houston State University</i> | dljones@shsu.edu | 49 |
| Jones, Robin | <i>Indiana University, Bloomington</i> | robijone@indiana.edu | 180 |
| Jones, Stacy R. | <i>Clemson University</i> | stacy9@clemson.edu | 44, 74 |
| Junor Clarke, Pier Angeli | <i>Georgia State University</i> | pjunor@gsu.edu | 175 |
| Jurgenson, Kari Nicole | <i>Iowa State University</i> | karij@iastate.edu | 168 |
| K | | | |
| Kalinec-Craig, Crystal | <i>The University of Texas, San Antonio</i> | crystal.kalinec-craig@utsa.edu | 43, 60 |
| Karunakaran, Monica | <i>Michigan State University</i> | karunak2@msu.edu | 186 |
| Kaschner, Scott | <i>Butler University</i> | skaschne@butler.edu | 34 |
| Kastberg, Signe | <i>Purdue University</i> | skastber@purdue.edu | 25, 192 |
| Kasten, Sarah | <i>Northern Kentucky University</i> | kastens1@nku.edu | 120 |
| Kelley, Traci | <i>The University of Texas, San Antonio</i> | traci.kelley@utsa.edu | 43 |
| Kerrigan, Sarah | <i>Virginia Tech</i> | stk123@vt.edu | 155 |
| Khalil, Deena | <i>Howard University</i> | deena.khalil@howard.edu | 109 |
| Kim, Nicholas | <i>University of Tennessee, Knoxville</i> | nkim2@vols.utk.edu | 108 |
| Kim, Young Rae | <i>Texas A&M University, San Antonio</i> | youngrae.kim@tamusa.edu | 117 |
| Kimmerling, Christina | <i>California State University, Long Beach</i> | christina.kimmerling@csulb.edu | 77 |
| Kinach, Barbara | <i>Arizona State University</i> | barbara.kinach@asu.edu | 117 |
| King, Barbara | <i>Florida International University</i> | bking@fiu.edu | 185 |
| Kirschner, Sara | <i>George Mason University</i> | skirschn@gmu.edu | 135 |
| Kirwan, J. Vince | <i>Kennesaw State University</i> | jkirwan@kennesaw.edu | 47 |
| Kline, Kate | <i>Western Michigan University</i> | kate.kline@wmich.edu | 99, 124 |
| Knapp, Melinda | <i>Oregon State University, Cascades</i> | melinda.knapp@osucascades.edu | 83, 138 |
| Knotts, Angela | <i>WestEd</i> | angelaknotts@gmail.com | 102 |
| Koester, Mark | <i>Metropolitan State University of Denver</i> | koesterm@msudenver.edu | 120 |
| Koestler, Courtney | <i>Ohio University</i> | koestler@ohio.edu | 51, 130 |
| Kokka, Kari | <i>University of Pittsburgh</i> | kokka@pitt.edu | 143 |
| Kosko, Karl W. | <i>Kent State University</i> | kkosko1@kent.edu | 157 |
| Kozak, Kathryn | <i>AMATYC</i> | kathryn.kozak@coconino.edu | 122 |
| Krause, Gladys | <i>William and Mary</i> | ghkrause@wm.edu | 87 |
| Krebs, Angela | <i>University of Michigan, Dearborn</i> | askrebs@umich.edu | 124 |
| Krupa, Erin Elizabeth | <i>North Carolina State University</i> | eekrupa@ncsu.edu | 104 |
| Kulow, Torrey | <i>Portland State University</i> | kulow@pdx.edu | 123, 163 |
| Kurtz, Brianna Ashley | <i>University of Central Florida</i> | brianna.kurtz@ucf.edu | 44 |
| Kurz, Terri L. | <i>Arizona State University</i> | terri.kurz@asu.edu | 28, 155 |
| L | | | |
| LaCroix, Tiffany | <i>Virginia Tech</i> | tlacroix@vt.edu | 174 |
| LaMar, Tanya | <i>Stanford University</i> | tlamar@stanford.edu | 166, 185 |
| Lamb, John H. | <i>The University of Texas, Tyler</i> | jlamb@uttyler.edu | 49, 76 |
| LaRochelle, Raymond | <i>University of Delaware</i> | rlaroch@udel.edu | 103, 144 |
| Lawler, Brian R. | <i>Kennesaw State University</i> | blawler4@kennesaw.edu | 92, 133 |
| Layton, Rebecca Doty | <i>University of Tennessee, Knoxville</i> | rdoty1@vols.utk.edu | 128 |
| Leaf, Abi | <i>Escondido Union High School District</i> | aleaf@euhsd.org | 92 |
| Leatham, Keith Rigby | <i>Brigham Young University</i> | kleatham@mathed.byu.edu | 139, 177 |
| Lee, Hwa Young | <i>Texas State University</i> | hylee@txstate.edu | 69, 79 |
| Lee, Jean S. | <i>University of Indianapolis</i> | jslee@uindy.edu | 40 |
| Lee, Mi Yeon | <i>Arizona State University</i> | mlee115@asu.edu | 6, 155 |
| Leshin, Miriam Simone | <i>Stanford University</i> | mleshin@stanford.edu | 185 |

| | | | |
|----------------------------|--|----------------------------------|----------|
| Lesseig, Kristin | <i>Washington State University, Vancouver</i> | kristin.lesseig@wsu.edu | 105, 150 |
| Lewis, Jennifer M. | <i>Wayne State University</i> | jmlewis@wayne.edu | 8 |
| Liebars, Cathy S. | <i>The College of New Jersey</i> | liebars@tcnj.edu | 2 |
| Lin, Hochieh | <i>The Ohio State University</i> | lin.2532@osu.edu | 117 |
| Lischka, Alyson E. | <i>Middle Tennessee State University</i> | alyson.lischka@mtsu.edu | 25, 59 |
| Litke, Erica G. | <i>University of Delaware</i> | litke@udel.edu | 106 |
| Liu, Jinqing | <i>Indiana University, Bloomington</i> | jinqliu@iu.edu | 24 |
| Livers, Stefanie D. | <i>Missouri State University</i> | stefanielivers@missouristate.edu | 154 |
| Lloyd, Gwendolyn | <i>Pennsylvania State University</i> | lloyd@psu.edu | 47 |
| Lochard, Alicia | <i>University of Pennsylvania</i> | lochard@sas.upenn.edu | 109 |
| LopezLeiva, Carlos A. | <i>University of New Mexico</i> | callopez@unm.edu | 22, 36 |
| Louie, Nicole L. | <i>University of Wisconsin, Madison</i> | nlouie@wisc.edu | 60 |
| Lucas, Carol | <i>University of Central Oklahoma</i> | clucas@uco.edu | 37 |
| Luebeck, Jennifer | <i>Montana State University</i> | jennifer.luebeck@montana.edu | 1 |
| Lynch, Sararose | <i>Westminster College</i> | lynchsd@westminster.edu | 83, 117 |
| M | | | |
| MacDonald, Beth L. | <i>Utah State University</i> | beth.macdonald@usu.edu | 89, 134 |
| Madis, Carlee Elizabeth | <i>Western Michigan University</i> | carlee.e.hollenbeck@wmich.edu | 27 |
| Magiera, Marta T. | <i>Marquette University</i> | marta.magiera@marquette.edu | 117 |
| Makowski, Martha | <i>The University of Alabama</i> | mbmakowski@ua.edu | 19 |
| Males, Joshua R. | <i>Lincoln Public Schools</i> | joshmales@gmail.com | 162 |
| Males, Lorraine M. | <i>University of Nebraska, Lincoln</i> | lmales2@unl.edu | 59, 94 |
| Mallam, Winifred | <i>Texas Woman's University</i> | wmallam@twu.edu | 194 |
| Malzahn, Kristen | <i>Horizon Research, Inc.</i> | kmalzahn@horizon-research.com | 42 |
| Mangram, Charmaine | <i>University of Hawaii</i> | cmangram@hawaii.edu | 85 |
| Manouchehri, Azita | <i>The Ohio State University</i> | manouchehri.1@osu.edu | 1 |
| Marin, Katherine Ariemma | <i>Stonehill College</i> | kmarin@stonehill.edu | 80, 117 |
| Marmur, Ofer | <i>Simon Fraser University</i> | omarmur@sfu.ca | 6 |
| Marshall, Anne Marie | <i>Lehman College</i> | anne.marshall@lehman.cuny.edu | 159, 196 |
| Martin, Kristi R. | <i>North Carolina State University</i> | kmartin8@ncsu.edu | 117 |
| Martin, Stephanie | <i>University of Rochester</i> | smartin@warner.rochester.edu | 102 |
| Martin, Tami | <i>Illinois State University</i> | tsmartin@ilstu.edu | 62 |
| Martin, W. Gary | <i>Auburn University</i> | martiwg@auburn.edu | 23, 193 |
| Matyska, Rob | <i>Indiana University</i> | matyskar@iu.edu | 117 |
| McCloskey, Andrea | <i>Pennsylvania State University</i> | avm11@psu.edu | 196 |
| McCulloch, Allison | <i>University of North Carolina, Charlotte</i> | amccul11@uncc.edu | 78, 139 |
| McGraw, Rebecca | <i>The University of Arizona</i> | rmcgraw@math.arizona.edu | 34, 58 |
| McMahon, Darcy | <i>Michigan Department of Education</i> | mcmahond2@michigan.gov | 124 |
| McMillan, Brandon | <i>University of California, Los Angeles</i> | brandon.g.mcmillan@gmail.com | 46 |
| McNally, Jennifer | <i>Curry College</i> | jmcnally@curry.edu | 91 |
| McNamara, Julie | <i>California State University, East Bay</i> | julie.mcnamara@csueastbay.edu | 181 |
| Meiners, Amanda | <i>University of Iowa</i> | amanda-meiners@uiowa.edu | 186 |
| Melville, Matthew | <i>University of Delaware</i> | melbob@udel.edu | 91 |
| Miller, Catherine | <i>University of Northern Iowa</i> | catherine.miller@uni.edu | 161 |
| Miller, Emily | <i>West Chester University</i> | emiller@wcupa.edu | 56 |
| Molitoris Miller, Susanna | <i>Kennesaw State University</i> | smolitor@kennesaw.edu | 127 |
| Mortimer, Jillian Peterson | <i>University of Michigan</i> | jbpet@umich.edu | 72, 166 |
| Morton, Karisma | <i>University of North Texas</i> | karisma.morton@unt.edu | 117 |
| Moscatelli, Maria | <i>Washington State University</i> | mmoscatelli@wsu.edu | 173 |
| Moss, Diana L. | <i>Utah State University</i> | diana.moss@usu.edu | 134, 189 |
| Munson, Jen | <i>Northwestern University</i> | jmunson@northwestern.edu | 17 |
| Myers, Marrielle | <i>Kennesaw State University</i> | mmyers22@kennesaw.edu | 84, 143 |
| N | | | |
| Nabours, Gina Marie | <i>Northern Arizona University</i> | gina.nabours@gmail.com | 150 |
| Naresh, Nirmala | <i>University of North Texas</i> | nirmala.naresh@unt.edu | 118 |
| Neihaus, Aubrey | <i>The University of Arizona</i> | aneihaus@gmail.com | 3, 34 |
| Neil, Bisola | <i>Bank Street College of Education</i> | bneil@bankstreet.edu | 141 |
| Nielsen, Porter | <i>Brigham Young University</i> | porternielsen@gmail.com | 53 |
| Nirode, Wayne | <i>Miami University</i> | nirodew@miamioh.edu | 33, 54 |
| Nitta, Kathleen | <i>Gonzaga University</i> | nitta@gonzaga.edu | 173 |
| Noblitt, Bethany | <i>Northern Kentucky University</i> | noblittb@nku.edu | 120 |
| Novak, Jodie | <i>University of Northern Colorado</i> | jodie.novak@unco.edu | 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 |
| Orr, Sheila | <i>Michigan State University</i> | sheilafrederixon@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@uncc.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> | stevehine@pacificu.edu | 20 |
| Rice, Courtney | <i>Pennsylvania State University</i> | c.lynch.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 |
| Safi, Farshid | <i>University of Central Florida</i> | Farshid.Safi@ucf.edu | 117 |
| 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@atuhaleh@atu.edu | 1 |
| Satyam, V. Rani | <i>Virginia Commonwealth University</i> | vratyam@vcu.edu | 88 |
| Schack, Edna O'Brien | <i>Morehead State University</i> | e.schack@moreheadstate.edu | 133 |
| Scroggins, Ashley | <i>University of Colorado, Boulder</i> | ashley.scroggins@colorado.edu | 12 |
| Danielle Seago, Nanette | <i>WestEd</i> | nseago@wested.org | 102 |
| Sears, Ruthmae | <i>University of South Florida</i> | ruthmaesears@usf.edu | 67, 85 |
| Seashore, Kimberly Shah, | <i>San Francisco State University</i> | kimseash@sfsu.edu | 169 |
| 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> | disherman@anselm.edu | 117 |
| Shulman, Jonah | <i>University of Nevada, Las Vegas</i> | Shulmj1@unlv.Nevada.edu | 61, 140 |
| Silverman, Jason | <i>Drexel University</i> | silverman@drexel.edu | 195 |

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

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

PROPOSAL REVIEWERS FOR 2020 ANNUAL AMTE CONFERENCE

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

| | | | |
|----------------------------|---|--------------------------------|--|
| 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&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> | | |

2020 AMTE BUSINESS MEETING AGENDA

Saturday, February 8, 2020

Phoenix C Ballroom, Sheraton Phoenix Downtown Hotel, AZ

A. WELCOME

MIKE STEELE, AMTE PRESIDENT, PRESIDING

B. APPROVAL OF THE MINUTES

SANDI COOPER

C. TREASURER AND MEMBERSHIP REPORT

SARAH QUEBEC FUENTES, TIM HENDRIX

D. CONFERENCE REPORT

TRENA WILKERSON & COLLEEN EDDY

E. DIVISION REPORTS AND RECOGNITIONS

Headquarters Division

Membership Division

Professional Learning Division

Publications Division

Advocacy, Equity, and Research Division

Communications and Outreach Division

Tim Hendrix, Executive Director

Maggie McGatha, Vice-President

Lynn Breyfogle, Vice-President

Babette Benken, Vice-President

Sarah van Ingen, Vice-President

Dustin Jones, Vice-President

F. NEW BUSINESS

G. INSTALLATION OF NEW BOARD MEMBERS

H. DISCUSSION: AMTE “LOOKING DOWN THE ROAD” TO THE FUTURE FOR MTE’S

AMTE is currently engaged in long-term planning to identify important priorities for the board of directors to work on over the next 3-5 years. Reflecting on this year’s opening session and your conference experience, please discuss the following questions with your table:

1. What do you see as the most significant challenges facing mathematics teacher education in the next 5-10 years?
2. What actions would you like to see AMTE take in the short term (12-18 months) to better support members and address challenges?
3. What actions would you like to see AMTE take in the long term (3-5 years) to better support members and address challenges?
4. Are there things that AMTE should not take on or should stop doing to better focus on the current needs of our membership?

I. ADJOURNMENT

2019 AMTE BUSINESS MEETING MINUTES

Saturday, February 9, 2019

11:45am – 1:15pm (EST)

Rosen Plaza, Ballroom B, Orlando Florida

Randy Philipp, President, called the meeting to order at 12:06 pm (EST).

I. WELCOME

RANDOLPH PHILIPP, AMTE PRESIDENT, PRESIDING

Randy started with a few announcements. The *Mathematics Teacher Educator* Journal seeks feedback from AMTE members to improve journal access and visibility, on an anonymous three-minute survey (link found at <https://www.surveymonkey.com/r/m6dp33z>). The Math Learning Center has two job opportunities and the links to these positions were shared with the membership. Randy pointed out that copies of the 2018 AMTE Annual Report were available on each table and this report provides a quick overview of what board and committees have been engaged in last year.

II. APPROVAL OF THE MINUTES

SANDI COOPER, SECRETARY

Sandi Cooper presented the minutes from last year's business meeting from 2018 conference. Motion to accept the minutes as presented moved by Maggie McGatha and seconded by Anita Wager. Motion passed unanimously.

III. TREASURER AND MEMBERSHIP REPORT

ANITA WAGER, TREASURER
TIM HENDRIX, EXECUTIVE DIRECTOR

Anita Wager shared the treasurer report which included the operating budget and the conference budget. The 2018 YTD Income is \$65,406 and Expenses is \$49,111. Current cash reserves are \$272,327. For the 2018 Conference in Houston, the conference income was \$232,129 and expenses were \$199,733, with a net income of \$32,356.

Tim Hendrix reported that current membership is 981, which is fairly consistent in last two or three years with a little fluctuation. There are 152 graduate student members and 30 Emeritus members. Current members are from ALL 50 states in the U.S., plus DC, Puerto Rico, and 4 Canadian provinces. In addition, there are members from Australia, Germany, India, Jamaica, Malta, Malaysia, Netherlands, and Saudi Arabia.

Tim reminded everyone to complete the conference survey and indicated that participants would receive an email with a link.

IV. CONFERENCE REPORT

SUSAN GAY, CONFERENCE DIRECTOR

Susan Gay, AVP for Conferences, Conference Director, offered thanks to all of the presenters and shared that there was a record number of sessions at this year's conference. She shared that she will send a letter on our behalf to express our thanks to hotel staff for their gracious hospitality. She announced that the 2020 conference will be in Phoenix, Arizona and the call for proposals will be available on March 1.

Randy acknowledged the local arrangements committee (names below) and Sarah Bush, Co-Chair for Registration, Farshid Safi, Co-Chair for Registration, and Megan Nickels, Co-Chair for Audio-Visual.

- Aline Abasssian
- Tuyin An
- Janet Andreassen
- Shahab Abbaspour
- Taylor Bousfield
- Angela Broaddus
- Lisa Brooks
- Jennifer Caton
- Siddhi Desai
- Daniel Edelen
- Heidi Eisenreich
- Bethany Fralish
- Gina Gresham
- Erhan Haciomeroglu
- Jeanine Haistings
- Adele Handlong
- Brianna Kurtz
- Carrie La Voy
- Carol Lucas
- Cathrine Maiorca
- Margaret Mohr-Schroeder
- Enrique Ortiz
- Katrina Rothrock
- Katie Salamanca
- Eryn Stehr
- Makini Sutherland
- Mathew Taylor
- Taylar Wenzel

Tim once again thanked Carol Lucas and Susan Gay for their service and presented them with a box of notes and plaque to recognize their years of service as Conference Director and Assistant Conference Director.

V. DIVISION REPORTS AND RECOGNITIONS

a. HEADQUARTERS DIVISION

TIM HENDRIX, EXECUTIVE DIRECTOR

Tim recognized outgoing AVP for Constitution & By-Laws, Sararose Lynch and incoming AVP, Megan Burton. He recognized AVP for Nominations an Elections, Toya Frank, who will continue in this role. Tim also announced that this committee would seek nominations for President-Elect, Secretary, and one Board Member-at-Large for 2020. (Report for this division can be found on pages 4-6 of the 2018 Annual Report located at <https://amte.net/sites/default/files/Annual-Report-2018-AMTE.pdf>)

b. MEMBERSHIP DIVISION

MAGGIE MCGATHA, VICE-PRESIDENT

Maggie recognized the three AVPs for this division which includes AVP for Affiliates: outgoing, *Tom Evitts*, incoming *Michelle Stephan*; AVP for Awards: outgoing *Lisa Poling*, incoming *Amanda Sawyer*; and AVP for Membership: *Nicole Rigelman*, who will continue in this role. Maggie encouraged members to consider four ways they can engage in AMTE. One was to join their state affiliate or if there was not a state affiliate to start one. Another was to nominate colleagues for the various awards that are available and indicated that information is found on the AMTE web site. And she invited members to share ideas about how AMTE can better support them. (Report for this division can be found on pages 11-12 of the 2018 Annual Report located at <https://amte.net/sites/default/files/Annual-Report-2018-AMTE.pdf>)

c. PROFESSIONAL LEARNING DIVISION

LYNN BREYFOGLE, VICE-PRESIDENT

Lynn shared the benefits of the recent restructuring of AMTE Leadership and how it created a more intentional collaboration across committees in each division. Out of this collaboration emerged several new initiatives such as manuscript review groups, TechTalk spots, and new webinars. She encouraged members to provide feedback on the conference evaluation and reminded them of the volunteer form found on the AMTE website site. Lynn formally thanked Susan Gay and Carol Lucas for their years of work organizing the annual conferences. Moving forward the plans are to organize an entire conference committee to organize the conference and take on the tasks that Susan and Carol have coordinate for years. This committee will be led by incoming AVP for Annual

Conferences, Trena Wilkerson. Lynn recognized the other AVPs for this division, which include: AVP for 2019 Conference program, outgoing *Dana Cox*, and incoming 2020 Conference Program, *AnnaMarie Conner*; AVP for professional development, outgoing *Sam Ekelson*, and incoming *Sararose Lynch*; AVP for STaR program, outgoing *Jeff Shih* and incoming AVP *Keith Leatham*; AVP for Technology, outgoing *Ryan Smith* and incoming *Amanda Thomas*. (Report for this division can be found on pages 13-15 of the 2018 Annual Report located at <https://amte.net/sites/default/files/Annual-Report-2018-AMTE.pdf>)

d. **PUBLICATIONS DIVISION**

BABETTE BENKEN, VICE-PRESIDENT

Tim Hendrix, on behalf of VP Babette Benken, recognized AVPs of this division which includes: AVP and Chair of Editorial Panel of MTE, outgoing *Gloriana González-Rivera*, and incoming, *Jan Yow*; Editor of *Mathematics Teacher Educator* (MTE), outgoing, *Sandra Crespo* and incoming, *Karen Hollebrands*, and Associate Editor, outgoing, *Kristen Bieda* and incoming, *Valerie Faulkner*; AVP for Connections Newsletter, *James Telese*, who will continue in this role; Co-AVPs for the CITE Journal, outgoing, *S. Asli Özgün-Koca*, continuing, *Beth Bos*, and incoming *Shannon Driskill*; AVP for Publications Review, *LouAnn Lovin*, who will continue in this role. (Report for this division can be found on pages 16-18 of the 2018 Annual Report located at <https://amte.net/sites/default/files/Annual-Report-2018-AMTE.pdf>)

e. **ADVOCACY, EQUITY AND RESEARCH DIVISION**

PAOLA SZTAJN, VICE-PRESIDENT

Paola thanked Randy for asking her to serve as VP for this division. With the new structure, she shared that it was fascinating to see how this group came together, much like a thinking tank, a space to consider the challenges and opportunities to think about how to work toward the future. Paola recognized the AVPs for this division which includes: AVP for Emerging Issues, outgoing *Shari Stockero*, and incoming *Zandra de Araujo*; AVP for Equity, outgoing *Marta Civil*, and incoming, *Carlos Lopes Leiva*; AVP for Research, outgoing *Blake Peterson*, and incoming *Megan Shaughnessy*. (Report for this division can be found on pages 19-20 of the 2018 Annual Report located at <https://amte.net/sites/default/files/Annual-Report-2018-AMTE.pdf>)

Randy recognized Paola Sztajn as outgoing VP and welcomed Sarah van Ingen as new VP for this division.

f. **COMMUNICATIONS AND OUTREACH DIVISION**

SUZANNE HARPER, VICE-PRESIDENT

Suzanne recognized AVPs for this division which includes: AVP for Web Development, *Joe Champion*; AVP for Sponsorship, *Damon Bahr*; AVP for STaR Fundraising, *Denise Spangler*; and AVP for Marketing, *Joel Amidon*. All of these AVPs will continue for 2019-2020 (Report for this division can be found on pages 21-22 of the 2018 Annual Report located at <https://amte.net/sites/default/files/Annual-Report-2018-AMTE.pdf>)

Randy recognized Suzanne Harper as outgoing VP of Communications and Outreach and welcomed Dusty Jones as incoming VP of this division.

VI. INSTALLATION OF NEW BOARD MEMBERS

RANDOLPH PHILIPP

Randy recognized outgoing board members, Anita Wager, outgoing treasurer, and Dorothy White, outgoing board member-at-large. Randy recognized incoming board members, Enrique Galindo, Board Member-at-Large, Sarah Quebec-Fuentes, Secretary, and Mike Steele, President.

Mike recognized the service of President, Randy Philipp, for the past three years and thanked him on the behalf of the entire membership for his outstanding leadership.

VII. DISCUSSION OF AMTE PRIORITIES

MIKE STEELE

Mike presented the 2019 Two-Year Strategic Priorities and provided an overview of each.

1. Explore multiple avenues for AMTE members to recognize and address inequities, building toward equitable practices.
2. Identify and engage a broader constituency for AMTE.
3. Engage membership in strategic planning for the organization.

Mike asked the group to engage in a brief discussion and provide feedback based on the following questions:

- What would you like to see AMTE focus on with respect to the three strategic priorities?
- What ideas do you not see represented here that we should be thinking about?

Members captured their ideas on index cards and shared in small groups discussions. Mike then facilitated a brief discussion with members to provide an opportunity to share some ideas that emerged in small groups with the entire group. Ideas that were verbalized included: we need to consider how to better integrate the AMTE Standards into the conference and our scholarship; researchers are often frustrated with policy makers not really listening, so it might be good to consider how to include policy makers in future conferences; Mike pointed out that we may need to consider how we engage policy makers locally through affiliates; we need to think about how to include more diversity at the conference and in the scholarship that is shared through presentations; we need to be cautious when reaching out to engage with a broader constituency (referring to priority #2) that we are careful not to compete with sister organizations, but to focus on ways to collaborate.

VIII. NEW BUSINESS

MIKE STEELE

Mike asked if there was any new business to consider. None was offered.

IX. ADJOURNMENT

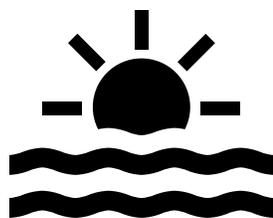
MIKE STEELE

Motion: To adjourn the 2019 AMTE Annual Business Meeting. Moved by Judith Jacobs, and seconded by Matthew Felton-Koestler. Motion passed unanimously.

MORE INFORMATION ON AMTE.NET

- AMTE Leadership, including members serving on committees and task forces
- AMTE Awards, including the Excellence in Teaching in Mathematics Teacher Education Award 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) 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).

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

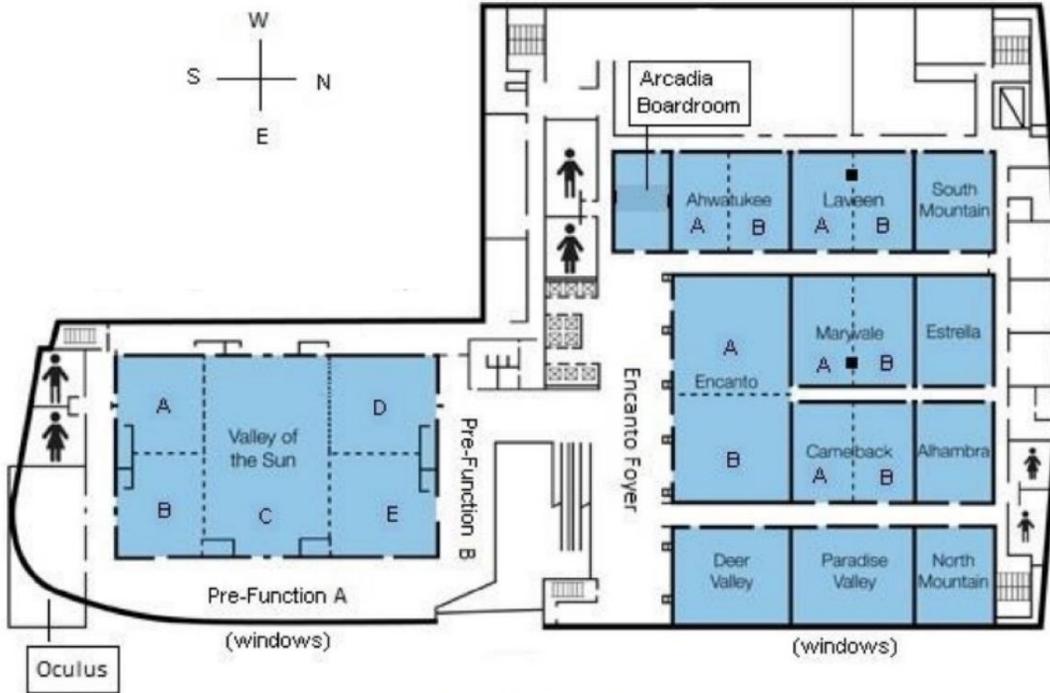
Visit amte.net/conferences for updated information about past and future conferences.

FUTURE AMTE CONFERENCES

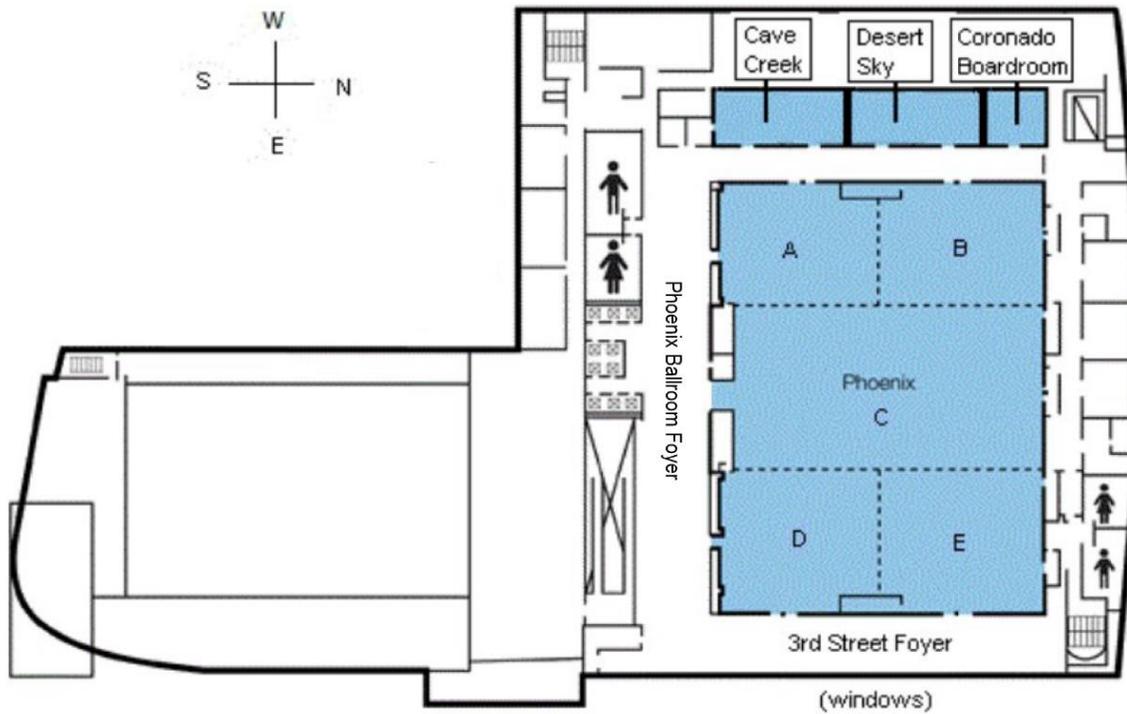
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|----------------------|--|------------------------|
| 2021 AMTE Conference | Rosen Centre Hotel Orlando, FL | February 11 – 13, 2021 |
| 2022 AMTE Conference | Hilton Las Vegas Resort & Spa Las Vegas, NV | February 10 – 12, 2022 |
| 2023 AMTE Conference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



SHERATON
Phoenix Downtown



SECOND LEVEL



THIRD LEVEL