2020 School Science and Mathematics Association Annual Convention

Event Schedule

Thu, Nov 05, 2020

9:15am

First Time Mentoring Session

9:15am - 9:45am, Nov 5

Join Zoom Meeting

https://zoom.us/j/94052079700?pwd=bHFGUUU3Qjg5ZUZQWENZQXpCa3BRQT09

Meeting ID: 940 5207 9700

Passcode: 755500

₹ Speakers



Suzanne Nesmith Associate Dean of Undergraduate Education, Baylor University School of Education



Andrea Milner Vice President and Dean of Academic Affairs, Adrian College

10:00am

Using 3D Printing Technology to Explore Math Modeling Concepts

② 10:00am - 10:50am, Nov 5

50-minute Regular Session

To view recorded session:

 $https://zoom.us/rec/share/-PggQLL9jzuS5aRpdGw6TmWMh5wU7Nn64_gwQtdu0RSN5xSayPePSZsrErRVxkSL.wM8m9PP45uwhbQ8w$

Passcode: T?QY?+47

Math modeling is an essential component of math and science standards and has the potential to enhance the teaching of STEM lessons that allows students to see various STEM concepts in action. In this presentation, participants will learn ways that educators from all STEM areas can integrate math modeling concepts through 3D design software and 3D printing in their classrooms.

♥ Speaker



Reuben Asempapa Penn State University-Harrisburg

The challenges and possibilities of the edTPA for mathematics teacher education @ 10:00am - 10:50am, Nov 5

50-minute Research Session

To view recorded session:

https://zoom.us/rec/share/kK6lc0pmnk8iUlJ4NYe1xSxy0VwS7xlzyV4gek9gNELnIPv4hoKPOC1YJEvgz4Ks.g1TY-N7jP3fsj8Zy

Passcode: @t9qe=JD

East Carolina University (ECU) is currently in its 8th year implementing the edTPA. This presentation discusses: (1) pre-service mathematics teachers' perceptions of the edTPA; (2) aspects of the edTPA that pose significant challenges for pre-service mathematics teachers; and (3) the impact of the edTPA on ECU's mathematics education program.

Speaker



Tony Thompson Associate Professor, Mathematics Education, East Carolina University

Understanding of decimals: the connection between standard algorithms and alternative strategies

10:00am - 10:50am, Nov 5

50-minute Research Session

Recorded session:

https://zoom.us/rec/share/0NxAstEXkeviA1XeEuRcrrWZVdTCW8rJ-CUWzbGsGrMPcCyYxmgJbx7ZR_I4F9xV.VC0kjhdy2SanYcIT

Passcode: 6+*l65=a

The importance of implementing mathematical strategies in different ways has been strongly emphasized at all grade levels. Through this presentation, participants will have deep understanding of multiple solution strategies, in particular, exploring how preservice teachers connect their procedural knowledge of decimal operations to their conceptual understanding using alternative strategies.

https://zoom.us/j/96057977840?pwd=TVc0cHR3TnNGZVBmMkdObEJFUmZTdz09

♥ Speakers



Eunmi Joung Assistant Professor, Midwest University



Cheng Yao Lin Southern Illinois University



Young Rae Kim Associate Professor, Texas A&M University-San Antonio

Catalyzing Change in Mathematics: Initiating Critical Conversations and Partnerships @ 10:00am - 10:50am, Nov 5

Presidential Exchange

Recorded Session:

https://zoom.us/rec/share/Z3-uZpErtmCBMcO1w8-QYZxYEiFsk-mToJ6Ml2LsuUgpCdHJfZTkzwKZff7s1WbF.7wRJ06Fi-3nA-BLI5

Passcode: bB.1im2G

Let's engage in conversation to discuss how we can work together to develop partnerships to address challenges and opportunities in PK-12 mathematics to ensure that each and every student has appropriate learning experiences. An overview of recommendations from NCTM's Catalyzing Change will be provided to initiate the conversations and then we will discuss implications for mathematics education.

Speaker



Trena Wilkerson Professor, Baylor University

Professional Development for Supporting the Development of Small-Group, Student-to-Student Discourse

10:00am - 10:50am, Nov 5

50-minute Regular Session

Recorded Session:

 $https://zoom.us/rec/share/iDoe2njHLKskm3H_2JbbUw8g79fQamhaGK7qXJvtGyinc81Lah7_sz_DF_p-vA4.OjgVUHW1cw1_PO-H$

Passcode: 4PiY1rQ^

This presentation shares a professional development (PD) program designed to support secondary mathematics teachers in fostering small-group, student-to-student discourse. The PD and associated tools guide teachers through a systematic process of assessing current small-group discourse and using this evaluation to use purposeful talk moves to improve the discourse quality.

♥ Speaker



Sarah Quebec Fuentes Professor, Texas Christian University

Impacts of course-based research projects using citizen science in evolutionary biology @ 10:00am - 10:50am, Nov 5

50-minute Research Session

Recorded Session:

https://zoom.us/rec/share/esj4r7LRQChmstQnht8DZN32EXk5_tNTBLbaAuqRWCFlUVm9aNncvyjv35NsLRAw.TdhSfuJztaNjp3E_

Passcode: J32kt&99

This session presents outcomes from a distributed research project (grades 6-16) that motivates the study of evolution with a current conservation issue: the decline of the migrating population of the iconic monarch butterfly. Students learn about evolutionary processes and their contribution to local adaptation as they make predictions and analyze data regarding common milkweed (A. syriaca).



Emily Mohl Assistant Professor of Biology and Education, St. Olaf College



Michele Koomen Associate Professor, Gustavus Adolphus College

11:00am

Exploring Multiple Representations of Exponential Growth with Pythagoras, PVC Pipes, and Pianos

11:00am - 11:25am, Nov 5

25-minute Regular Session

To view the recorded session:

https://zoom.us/rec/share/wewtSWfEllfXh6YNeznK1dX_H4lM5VJi8Yj8Pk-J4LKMSyAARVggEpO60gAukl3F.e2YOUEYONCse9jTl

Passcode: 7E+u*Vr9

In this session, participants will explore the connections between exponential growth and musical structures. A series of music-integrated hands-on activities and mathematical tasks will be presented. Participants will discover how the intricate connections between music and mathematics create opportunities to engage students in a relatable context as they make connections between multiple representations of exponential growth.

♥ Speaker



Danielle Divis Utah State University

Investigating the Changes in Attitudes Toward Science Among Pre-Service EC-6 Teachers **②** 11:00am - 11:25am, Nov 5

25-minute Research Session

To view recorded session:

https://zoom.us/rec/share/HfzJHcxEQ1OwwHbtEINCW6PsyLj47wpwCJflcPsKwi0hJUAiOg-PxIIFHIG1UbzZ.oHZLgegNjGa0vWH6

Passcode: U4*E6#2m

This study examines the attitudes towards science of elementary pre-service teachers (PSTs) at a large public university in Texas. The study involved the validation a new version of the well-established Test of Science Related Attitudes (TOSRA) (Fraser, 1978) to assess PSTs attitudes towards science. This study is significant as TOSRA has not previously been validated at the university level.

Speakers



Chris Long Assistant Professor, K-12 Science Education, University of North Texas



Supporting and Retaining Early Career Mathematics Teachers Through Targeted Interventions @ 11:00am - 11:25am, Nov 5

25-minute Research Session

This session reports on the design, implementation, and initial findings of two year-long (AY 2019-2020) interventions intended to support secondary mathematics teachers in their first or second year. The interventions helped teachers develop relationships with a school-based mentor, helped to create an online community of practice, and aimed to strengthen their relationships with administrators.

View recording at:

https://zoom.us/rec/share/oNZJSTaMh3goApk21A4319XxOQREn-9jZBVFW9mWUEDO9RDHwbQMrAhNGxwbUa0J.JwdYycq7Rd1kFhI2 Passcode: X\$3fy.@G

Speaker



Lisa Amick Clinical Associate Professor of Mathematics Education, University of Kentucky

Cultivating Pre-Service Teachers' Makerspace Mind through Partnership with School Librarians

11:00am - 11:25am, Nov 5

25-minute Research Session

Most school librarians not only provide regularly scheduled library sessions but also Makerspaces to elementary and secondary school students. The purpose of this study was to examine pre-service teachers' interest and attitudes towards Makerspaces through partnership with school librarians.

View recording at:

https://zoom.us/rec/share/meGFGv5zlgfe5zufDpp1RttlYUgH2_wPmEmfvTbNggjHSFH7fAmCjLCx02nD VUo.FYyTPSe1Q9chlAFJ

Passcode: 57vT^fqu

♥ Speakers



Li Sun Assistant Professor, Augustana University (SD)



Anita Manning Assistant Professor of Education, Augustana University

Mathematical Creativity and Creative Self-Efficacy

11:00am - 11:25am, Nov 5

25-minute Research Session

Elementary school students were assigned to two groups as problem posing and control. Results noted that students in problem posing group increased their mathematical creativity scores more than students in control group. This study suggests integrating problem posing and similar instructional practices into mathematics classrooms to increase students' creative abilities in mathematics.

View recording at:

 $https://zoom.us/rec/share/fYuLzSJhyHlbBCORD1AGUo1ggAx6XWvTSB_CZlhxljQS4tCD27kOtBdh17HO_ttY.avjRv7aRlymlyW81$

Passcode: P2^c%?T9

Speakers



Ali Bicer Assistant Professor, University of Wyoming



Yujin Lee Assistant Professor, University of North Dakota



Mary M. Capraro



Robert M. Capraro Co-Director, Aggie STEM Center

11:35am

Effect of an Integrated STEM Unit on Content Knowledge and STEM Efficacy

11:35am - 12:00pm, Nov 5

25-minute Research Session

To view recorded session:

 $https://zoom.us/rec/share/02A6dFFvu4gKaVNoiNKyct7J4nKs4OvQ2CReJjdCO0rT_dXftK_-XcNrzffn74M.ehtXuBcny60ThYww$

Passcode: 5Q@JE2Q!

This study focuses on an integrated STEM unit that addresses science and mathematics standards and incorporates the engineering design process through hands-on and software activities. The fourth-grade students who engaged in the curriculum showed slight increases in STEM efficacy and significant gains in mathematics and science content knowledge.

Speakers



Kari Jurgenson Doctoral Candidate, Iowa State University



Christa Jackson Associate Professor, Iowa State University



Ashley Delaney Heartland AEA - Iowa DE

Tweaks Made to a Calculus Class in the Wake of the COVID-19 Pandemic

11:35am - 12:00pm, Nov 5

25-minute Regular Session

To view recorded session:

https://zoom.us/rec/share/DZjFXUOpllmg9zPiEV1Xq7tKrHA5QVSgxA04dG6afF2vGkdcYH1ZI14MBy6o SkE.R_yDOBmm2ywiYapP

Passcode: DZ*M9i%2

The COVID-19 Pandemic caught everyone off-guard in the middle of Spring 2020 semester. This talk will outline changes that were made to a Calculus Class in the wake of the Pandemic. The second part of the course had to be completed remotely due to the CDC-backed and government-enforced stay-at-home and social distancing order. Students' reflections will be shared.

♥ Speaker



Abraham Ayebo Assistant Professor, University of Minnesota Rochester

How Readability Levels Impacts Elementary Mathematics Standardized Testing **②** 11:35am - 12:00pm, Nov 5

25-minute Research Session

Recorded session:

 $https://zoom.us/rec/share/Qu1BYey-zxrKKs2l8bHylHZlU73ZHOPaYP1rVCCtJBqEKBz-Fgp96gjBYaKuUA_D.~q1q2CAaBCkjlRlbp\\$

Passcode: PxaK.6n?

Does Massachusetts really have the smartest students in the United States? Data from national assessments show that two states (ranking 39th place versus first for state scores) were both significantly higher than the national average in mathematics. How can this be possible? This session compares the readability level for 2019 state released tests to help answer this question.

♥ Speaker



Amy Corp Associate Professor C&I, Texas A&M Commerce

Supporting Early Career Mathematics and Science Teachers and Career Changers @ 11:35am - 12:00pm, Nov 5

25-minute Research Session

Recorded Session:

https://zoom.us/rec/share/3uEshsgx3t8kFm7M9VcqsQXiAOLDN2u1YuP7filbgsGJjhWchFJuJiYNwVsx

NO8X._0b1Cj9_kldRiTle

Passcode: K0hyM!58

The purpose of this research study was to describe how the practices of eight early career science and mathematics teachers, some of whom are career changers, were influenced by their interactions with mentors and professional communities. Findings indicated these interactions influenced the teacher's decisions to adopt several important components of a learner-centered approach to teaching.

♥ Speaker



Timothy Surrette Assistant Professor of Education, University of Maine at Augusta

History of Mathematics in the Classroom: A Focus on Cultures

② 11:35am - 12:00pm, Nov 5

25-minute Research Session

Recorded Session:

https://zoom.us/rec/share/DLOThrlnB__CAO02h1Ystfi5DA_rkvuQ7qfo6a09T48t0twxAiAlSlof5BxMJFcP.HgA41Vgll1Vpplyd

Passcode: Yu5E3EV@

This presentation gives a brief overview of mathematics history through the contributions from various cultures. It provides ideas for using mathematics history to motivate students. The presentation will be interactive and have teachers solve historical problems and we will discuss how mathematics history can be used in the classroom.

Speaker



Brian Evans Professor, Pace University

12:00pm

How Science and Math Led to Riding Rockets and a Spectacular View

② 12:00pm - 1:00pm, Nov 5

Keynote Lunch

Keynote Presentation recording can be viewed using this link and passcode:

 $https://zoom.us/rec/share/s1KAhCW3mWGQSm9luGS0vul66GZtjJXw0ixNXpHTOyWKcE3uoQ7d9aLCIA_LyhDM.e1br7T2QUelmF2VH\\$

Passcode: 3bJfb+sD

♥ Speaker



1:00pm

A Case Study of American Students Solving Mathematical Problems Written in Mandarin 20 1:00pm - 1:25pm, Nov 5

25-minute Research Session

Recorded Session:

https://zoom.us/rec/share/nqj8Yzft5qtMaAM9iXSmef6iwuyfpXoyE44iEKDoXYse8T58g1DAVy4ZJ8Xr9zzt.bHjlJNSEhIE1VZzb

Passcode: H=#S4L8f

How do American students perceive and solve Mandarin written math problems? This presentation reveals the problem-solving process of two English native speakers who are learning Mandarin and discuss if the Polya's problem-solving process also applies to Mandarin learners as well.

♥ Speaker



Howard Chueh Southern Illinois University Carbondale

Exploring the Connections Between SSR and SSI PCK

1:00pm - 1:35pm, Nov 5

25-minute Research Session

To view the recorded session:

 $https://zoom.us/rec/share/3q8G9unvJv6soKVCTPCunrde1GpwXxAmkQg3MWiusU8GXA6OF0MYAG3KZAcG4iY\\3.fnEfG6UEQpNwvPAQ$

Passcode: 4rk%Typd

Our study sought to explore connections between teachers' socioscientific reasongins (SSR) and socioscientific issues (SSI) pedagogical content knowledge (PCK). Science teachers were interviewed with a Think Aloud Protocol and questioned using the QuASSR questionnaire and the CoRe document. Qualitative methods were used to analyze interviews. Implications for teacher education will be discussed.

Speakers



Kinsey Zacharski Drake University



Lucas Menke Drake University

Investigating the Development of Preservice Teachers' NOS Pedagogical Content Knowledge @ 1:00pm - 1:25pm, Nov 5

25-minute Research Session

To view recorded session:

https://zoom.us/rec/share/cjxAS2bcEXmpa1JKupcYnRMgGG4_lUgOrqQOqklwiyqgt3LE8iP6YBd_OX8RclJK.FG aqIMY4r9628Axe

Passcode: Mb1%fqN4

Through a semester-long study, preservice teachers' NOS PCK was measured to assess how and when understandings grew. Findings illustrate the importance of explicit and reflect instruction concerning NOS pedagogy as well as NOS content and the importance of NOS teaching experience for the development of NOS PCK. Implications for teacher education will be discussed.

Speakers



Jerrid Kruse Chair, Dept. of Teaching & Learning, Drake University



Sarah Voss Doctoral Student, Drake University

The Integration of Engineering in Integrated STEM Lesson Plans by Elementary Pre-service Teachers

1:00pm - 1:25pm, Nov 5

25-minute Research Session

As STEM education becomes more prevalent in the K-12 setting, it is important to study how it is implemented in the classroom. This presentation discusses a study that investigated how pre-service teachers, enrolled in an elementary mathematics methods course, incorporate engineering into their integrated STEM lesson plans after being immersed in an integrated STEM informal learning environment.

View recording at:

https://zoom.us/rec/share/kx_opO-nGPXPqd01vKfzl1usMOjVmj8BTymonetzZbiiXYDcS-zfJ6N8AxTTbxHU. Hwp9GuNzRdjrJ6MC

Passcode: G&@hq5z^

♥ Speakers



Cathrine Maiorca California State University, Long Beach



Margaret Mohr-Schroeder University Of Kentucky

Pedagogical acts: scaffolding chemistry literacy using multimodality and the 5R Instructional Model

② 1:00pm - 1:25pm, Nov 5

25-minute Research Session

Science literacy is often a gatekeeper. This paper examines an instructor's pedagogical actions as he integrated multimodal language and the 5R Instructional Model within a summer course. Specific examples of each R (repeat, reveal, reload, reposition, replace) provide evidence of opportunities for the high school

students to engage in science literacies during authentic chemistry research.

View recording at:

 $https://zoom.us/rec/share/CmegOU5OVorOMb0LxhzGyq-xlgT390s09UaQCAPPTEdNtqgNlW-QQnsCa_klTlm-.lGTS31aQOlR-VXfU\\$

Passcode: tPYG\$8=.

♥ Speakers



Heather Thompson Doctoral Student, Texas Christian University



Molly Weinburgh Director: Andrews Institute of Mathematics & Science Education, Texas Christian University

1:35pm

Using STEAM to Develop Middle School students' Computational Thinking

1:35pm - 2:00pm, Nov 5

25-minute Research Session

This session shares results of an innovative partnership between university faculty and an art museum to create an informal STEAM learning experience. The program integrated art, coding, and creative problem-solving to engage middle school students in computational thinking activities. Preliminary findings show positive shifts in students' perceptions of STEAM and their computational thinking.

View recording at:

 $https://zoom.us/rec/share/MD6TfsWQeoXfZHmxfjFxud766HCk_c0gCnhcSxt2cUuko7v01Xf-P9-GVnU2OHs.IWieTKDU4I7H7SH1\\$

Passcode: Ym*V34V*

♥ Speakers



Thomas Roberts Assistant Professor, Bowling Green State University



Jerry Schnepp Associate Professor, Bowling Green State University

Intertwining Measurement, Data and Geometry CAEP K-6 Standards inot a Mathematics Course

1:35pm - 2:00pm, Nov 5

25-minute Regular Session

To view recorded session:

 $https://zoom.us/rec/share/lKoqTzEdwKdjRUJLldp3VTh-IniEX18BZknJf4_oTReipAQCQNgpR5tji9-nsldX. eZkBkLvEVpXlOtJu\\$

Passcode: 8vt*H9\$+

This presentation will tell the story of the development of a math course designed to cover the CAEP standard domains of Measurement, Data, and Geometry for grades K-6. Through this story, participants will discuss the course calendar, learn about how CODAP and Model Eliciting Activities were utilized, and discuss some of the pitfalls of developing a new course at a university.

♥ Speaker



Michael Daiga Assistant Professor, Wittenberg University

Using Engaging Stories to Integrate Science, Reading, Writing, and Mathematics

1:35pm - 2:00pm, Nov 5

25-minute Regular Session

To view recorded session:

Passcode: +D2N^MNE

In this session guided inquiry lessons developed for high school students at a literacy festival as well as online reading-based lessons will be presented. These lessons integrate science, mathematics, and English language arts and are correlated to the Next Generation Science Standards (NGSS), emphasizing the disciplinary core ideas, crosscutting concepts, and science and engineering practices.

♥ Speaker



Susan Cooper Assistant Professor, Florida Gulf Coast University

People and the Planet: Using Data-Rich Lessons to Teach Human Ecology

1:35pm - 2:50pm, Nov 5

75-minute Workshop

Recorded Session:

 $https://zoom.us/rec/share/JB5BZ2NzWNQ67ZBvA9aPL-D2MW6bz_Imqkfy3wfU9kP-6LTJzeeYv4vuxvqqa4GR. yN9wjtXlbVjk-nC9$

Passcode: XjHHR18*

Discover innovative ways to teach students about human-environmental interactions - building STEM skills through problem solving, mathematical modeling, interactive technology and data analysis. This interdisciplinary workshop will engage participants in exploring human population trends, resource use, climate change and more. Participants will receive electronic versions of materials and lessons.

♥ Speakers



Lorraine Howard President, Women and Mathematics Education



Ashley R. Townes Fisheries Ecologist, University of Washington-School of Aquatic and Fishery Sciences

Constructivism in K12 classrooms: A cross-examination of science and mathematics lessons @ 1:35pm - 2:00pm, Nov 5

25-minute Research Session

Most teachers have an awareness of constructivism but struggle with integrating the core features in their lessons. This inquiry examined the pedagogical fundamentals of constructivist teaching in sample K12 science and mathematics lessons. Practical processes for effective integration in both content areas are recommendations and would be useful for practitioners and teacher preparation programs.

View recording at:

https://zoom.us/rec/share/xVMs9EX9Dk0wKQLBezYMmGUWMu5m4C8HLXqzJqVJP5e95hrvv5gl1wcO3oJKTX3.2xtpK4drGsErP-To

Passcode: %0Jj8YXw

Speaker



Justina Ogodo Assistant Professor, Baylor University

A Case Study: Investigating Preservice STEM Teacher Education in Iowa

1:35pm - 2:00pm, Nov 5

25-minute Research Session

Recorded session:

 $https://zoom.us/rec/share/_h8ZgfllFwJkE48ZswAmoyz3l8XSNsqe2ZIDcfxV8PehsGcpaY1qOGfnjl3Loy76.\\ JoVOKFaROWztSOvi$

Passcode: vU5g.mG=

Qualitative evidence on the current status of STEM preservice teacher development in the state of Iowa will be presented. Findings focus on how teacher prep faculty are teaching and running STEM endorsement programs e.g., what decisions were made, why those decisions were made, how those decisions were implemented and the results of those decisions.

Speaker



Joleen Henning Drake University

2:10pm

Engaging Elementary Pre-Service Teachers in Posing Problems Through Children's Literature 2 2:10pm - 3:00pm, Nov 5

50-minute Regular Session

Recorded Session:

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Passcode: K0hyM!58

In this session, examples of using children's books in elementary mathematics methods coursework will be shared, along with mathematics concepts identified by preservice teachers and changes in their planning for problem-based lessons. Participants will use children's literature to consider their mathematical noticing and wondering, write problems based on those contexts, and share with the group.

♥ Speakers



Nicole Gearing Assistant Professor of Elementary Education, Utah Valley University



Andria Disney Assistant Professor, Utah Valley University

Connecting the van Hiele Levels to a Standards-Based Approach for Teaching K-6 Geometry 2:10pm - 3:00pm, Nov 5

50-minute Regular Session

Recorded Session:

 $\label{lem:https://zoom.us/rec/share/bLq2Kz4eSbOQXBHMTYQ0JdVrUbiROMBqjzboJgt3s8ebr2rEVxiptg-UuZ_pnXhE.JhAPHy39Pjkale-P$

Passcode: U\$mfg5?E

All teachers are tasked with implementing standards-based curricula, while supporting the needs of all students. This encompasses the inclusive environment. This session will discuss the van Hiele levels and ways to effectively implement K-6 grade geometry activities and strategies to support their students at their level, while holding high expectations for all.

♥ Speakers



Ashley Kopp Graduate Student, Indiana University of Pennsylvania



Valerie Long Assistant Professor of Mathematics, Indiana University of Pennsylvania

Making Science Learning Lifelong, Lifewide and Lifedeep: The Importance of Out-of-School STEM Learning

2:10pm - 3:00pm, Nov 5

Presidential Exchange

To view recorded session:

 $https://zoom.us/rec/share/N6ZBC7DvLaJvXFLgywnZ3Wz4J5AOW4deS9xRDyEKlzsVCHi3lhC5mL4oyRcXP1--.KUSDvOLIo_1mOXGM$

Passcode: mxp\$7#\$2

Adults with an interest in science more likely develop that interest through out-of-school STEM learning activities than in-school experiences. This is especially true of children under age 11. This presentation examines the research regarding when and where STEM learning occurs, when it is most important for developing a future interest in STEM, and the role of out-of-school STEM learning.

▼ Speaker



Dennis Schatz Retiring President, NSTA - National Science Teaching Association

Investigating Discourse Practices in STEM Undergraduate Classes using DART

② 2:10pm - 3:00pm, Nov 5

50-minute Research Session

To view recorded session:

https://zoom.us/rec/share/Exy7rXm9P14UqqYZZMXBsNvmXti3XVKr0g2BtRPaidjVuSHsQIJHWhT71JaAbzzK.W o4RpJzQ_pf_XugA

Passcode: v4pRFYz^

This exploratory study investigates the use of the Decibel Analysis for Research in Teaching (DART) to analyze classroom audio recordings, the use of productive discourse practices, and student learning gains. DART has the potential to help faculty analyze and assess the ratio of lecture to non-lecture, and thereby assess their use of innovative practices such as productive discourse.

Speakers



Megan Clawson Faculty Developer, Texas Christian University



Lara Charles-Kuhlman Doctoral Student, Texas Christian University



Jayme Del Mario Doctoral Student & Science Coach, Texas Christian University



Molly Weinburgh Director: Andrews Institute of Mathematics & Science Education, Texas Christian University

3:10pm

An Investigation of Pre-service Teachers' Understanding of Integers Through Writing Story Problems

② 3:10pm - 4:00pm, Nov 5

50-minute Research Session

Results will be shared from a study conducted with pre-service elementary teachers to explore their

conceptual understanding of integers through a lens of writing and solving story problems. A pretest post-test design was used, with data analysis focused on contexts, models, and solution strategies. In addition, an overview of the instructional activities completed during the unit will be shared.

View recording at:

https://zoom.us/rec/share/xTwQT9f4uOPQum7HcvSLiSPFZEPxMXCXmwlRCminzoh8kBAzI1cF80LZEkAm JAPV.LQzb5hCpBuxx1nOG

Passcode: aBKXH6A.

♥ Speakers



Kathy Horak Smith Assistant Professor, Tarleton State University



Alexzandria Hart Teacher, Arlington ISD



Beth Riggs Associate Professor, Tarleton State University

Preservice K-8 Teachers' Interpretation of Mean in a Contextualized Problem

② 3:10pm - 4:00pm, Nov 5

50-minute Research Session

The purpose of this session is to discuss how preservice teacher candidates enrolled in probability and statistics courses for K-8 teachers interpreted mean in a contextualized problem, based on a 2007 NAEP item, using various stems. Data analyses found candidates have difficulties interpreting mean regardless of stem. Implications for teacher education and professional development will be shared.

View recording at:

https://zoom.us/rec/share/huytW5wdHJGPJB2JsK83Vp7NAtN41Db6CRgw0miEbgaB766ffrOM_6FrbLlkVl07.Ez-UrSMTBtlCUdn9

Passcode: 6?Km\$w9y

♥ Speaker



Gregory Chamblee Professor, Georgia Southern University

Introducing the Handbook of Research on STEM Education

② 3:10pm - 4:25pm, Nov 5

75-minute Workshop

In this session the new Handbook of Research on STEM Education will be introduced to attendees (publication date fall 2020). Authors from several chapters within the Handbook will be on hand to share summaries of research from their respective chapters and will engage in discussion with the group about the findings. Topics will include STEM literacy, STEM policy in the U.S. and Canada, and others.

View recording at:

https://zoom.us/rec/share/vZkzLzS5JFEinboFlYXiiAyXewe-fiz4W-N1qq_FTWcSLrH9xB_bZabrZhmzsdT8.xMBrFM4jCx-qhdR8

Passcode: *WEim7Fh

♥ Speakers



Carla Johnson Executive Director and Associate Dean, NC State University



Margaret Mohr-Schroeder University Of Kentucky



Digna Couso RESERACHER IN SCIENCE EDUCATION, UNIVERSITAT AUTONOMA DE BARCELONA (SPAIN)



Alan Zollman Professor, Indiana University Southeast

STEM Pre-service Teachers' Development of TPACK by use of Modeling & Simulation Applications

② 3:10pm - 4:00pm, Nov 5

50-minute Research Session

This qualitative study of secondary STEM pre-service teachers' development of TPACK by use of modeling & simulation (M&S) applications, focuses on aspects of performance tasks that assess TPACK and how self-reported TPACK measures align with demonstrated knowledge. Findings noted high marks on TPACK self-scores but weaker identification of features of M&S applications integrated into instruction.

View recording at:

https://zoom.us/rec/share/o-ieUybjUq5dM3Su1eAN8T9GvU7ujQ7V0QIsCPC269pCrHqOBCPx194JUL5RW-AI.H2JVoLMu-acu0EDd

Passcode: p^@bJ48V

Speakers



Mary Enderson Associate Professor, Old Dominion University



Ginger Watson Associate Professor, University of Virginia

Using Real-World Data for Elementary Environmental Studies

② 3:10pm - 4:25pm, Nov 5

To view recorded session:

 $https://zoom.us/rec/share/LBtLFKqsP_vmNYMRCloSZG2BQeF33fhty8XGYL7XkOwyefWDRTvO-KzSuezjdg0J. gfJptqhJ98wGhH9G\\$

Passcode: n!b22u\$=

Discover hands-on activities that introduce students to gathering, representing and interpreting data on land and water use, population ecology and sustainability. Learn how to implement these activities as part of broadening students' understanding of NGSS Topics, Interdependent Relationships in Ecosystems, and Earth's Systems.

♥ Speakers



Lindsey Bailey Teacher Training Manager, Population Education Program, Population Connection



Abigail Watkins Population Education

4:10pm

Impact of Professional Development on Middle School Science Teachers' Engineering Self-Efficacy

2 4:10pm - 4:35pm, Nov 5

25-minute Research Session

To view recorded session:

https://zoom.us/rec/share/bd_DcAAzJNYQQspyEdyD4sHD4znlBVR-QrhiCNbF7DeMzgPloxZb0K45FRMsOHVn.qXECk4tzTfAtF44g

Passcode: +sa4t*NN

This mixed-methods study explores the influence of professional development on teachers levels of engineering self-efficacy and the likelihood to teach engineering.

♥ Speaker



Holly Miller Doctoral Candidate, Texas Tech University

Math during wartime: A reflection on curriculum reform

2 4:10pm - 4:35pm, Nov 5

25-minute Regular Session

Recorded session:

https://zoom.us/rec/share/7CAj--eGUtmIRTEbsAxqy5VkDIIEwxtd5NTSIQ-yOchG_kHlb4hGNmPC7BI_qlyw.kmxaomvOG473489Y

Passcode: ?.*v8vnX

In 1941, Admiral Nimitz was concerned about the lack of mathematical preparation among entering freshmen: 68% failed an arithmetical reasoning test. A curriculum reform in the 1920s had stripped the high school curriculum to bare essentials. I will discuss curriculum changes in the Navy during the war and changes to the secondary mathematics curriculum during and after the war.

Speaker Speaker



Oscar Chavez Associate Professor, Illinois State University Full-time

Children's Fraction Conceptions through Integrated Number-line Estimation and Equalsharing Tasks

2 4:10pm - 4:35pm, Nov 5

25-minute Research Session

Recorded Session:

Passcode: &0atP@Pd

This qualitative study investigated how 3rd-5th graders perceived fractions on a number line. Preliminary analysis showed that some participants modified their estimated fraction positions on a number line after solving hands-on equal-sharing tasks. The proposed approach has the potential to foster children's fraction understanding across quotient and measurement subconstructs.

♥ Speaker



Hochieh Lin Ohio State University

Posters? What does that have to do with learning and teaching mathematics?

2 4:10pm - 4:35pm, Nov 5

25-minute Research Session

Recorded Session:

 $\label{lem:https://zoom.us/rec/share/hkzJvA5qch_htqkwSOuZzHBnK-W6cFykOPTArM1AHp5x8j_HG68vwDScDjQsvbjV. DVaNHsB2mh489kPX$

Passcode: !Dah*W5k

Research supports and educators understand the importance of a rich, classroom environment. However, how do math posters in the classroom impact teaching and learning? Two researchers, from two different states, had their pre-service teachers (PSTs) use a survey tool to analyze posters in several mathematical classrooms. The results of this survey and the PSTs' perceptions will be shared.

♥ Speakers



Audrey Meador Assistant Professor of Mathematics , West Texas A & M University



Georgia Cobbs Professor, The University of Montana

4:45pm

The Relationship Between Academic Achievement and STEM Self-Efficacy

2 4:45pm - 5:10pm, Nov 5

25-minute Research Session

To view recorded session:

https://zoom.us/rec/share/YAlFiKOqQeDJ3wyTtzRHSF1DoxiT2n3C98l3KeV1goCjGduBv4xUTocgSucpMRFn.jZl8ZusDZL6l6gpr

Passcode: 7?XyVc.&

This study uses social cognitive career theory as a framework to understand how student experiences and achievements shape their self-efficacy in STEM. A survey was used to look at the relationship between achievement and STEM self-efficacy, controlling for race, gender, and size of high school attended. This session will detail the results of this analysis.

Speaker



Drew Gossen Graduate Teaching and Research Assistant, Oklahoma State University

Teacher Self-Efficacy Teaching ELs in Secondary Mathematics

4:45pm - 5:10pm, Nov 5

25-minute Research Session

To view recorded session:

https://zoom.us/rec/share/W4az2TP-FUy4uBG5lrlgz3fEVVHpCrMWtjH_5bppQ4WSlCj7FlBmnDeRSU6Pn7Cy.fw8iQPaJklkyV-KS

Passcode: 3gd?Zz5+

The purpose of this study is to analyze factors that may influence secondary mathematics teachers' sense of teacher self-efficacy (TSE) in working with English learners (ELs) in the mainstream classroom.

Speaker



Lynn Columba Associate Professor, Lehigh University

Prospective elementary mathematics teachers learning from Latinx families and communities @ 4:45pm - 5:10pm, Nov 5

25-minute Research Session

This presentation reports on the results of a qualitative study exploring what Latinx prospective elementary mathematics teachers say they learned from Latinx families and communities during the activities and interactions provided during their methods course.

View recording at:

https://zoom.us/rec/share/nt4sSU89-u7YAjw6X_1NSJvy7nFWjHK5GdRllcwkirlxGy3D8nTeqoUr4o_JFcZv.s3TBjADusamDODiC Passcode: W%pXq8!X

Speaker Speaker



Traci Kelley University of Texas at San Antonio

Comparison of Students' Perceptions of Thinking in a Traditional and Inquiry-Based Laboratory Course

② 4:45pm - 5:10pm, Nov 5

25-minute Research Session

Inquiry-based lab experiences have been shown to be more effective than traditional lab experiences. Students' perceptions of the types of thinking required in science lab settings have implications about students' beliefs about learning. This study compares students' perceptions about the thinking required in traditional and inquiry laboratory settings. Implications for practice will be shared.

View recording at:

 $https://zoom.us/rec/share/7ztAXOD14LWfCzOH9S3GeJ-Tz5cfl7tQWZrKFXz7By_KXi9I_ca0FV1AHlooE7pt._Q_k3bimZZGq1qSm$

Passcode: 7JI+RgbY

♥ Speaker



Lucas Menke Drake University

Building Bridges: Carver Bridge to STEM Success Students' Experiences and Sense of Community

4:45pm - 5:10pm, Nov 5

25-minute Research Session

Recorded Session:

 $https://zoom.us/rec/share/oO3bSOCl3wXFUXVFcVvJMur_QfilhUiXV2C3bwCCKipY5PCDJIM1yWyNpN32lDy_.1utAHnhfNzEbuDrt$

Passcode: %Pp9A@s3

Bridge programs have been designed to retain students in STEM fields. We sought to understand 15 Carver Bridge program students' experiences and their sense of belonging. Themes of the study include seeking opportunities, the important role of professors, and viewing the bridge program as at home base. We outline the major strengths of Carver Bridge as seen by the students.

♥ Speakers



Jesse Wilcox Assistant Professor of Teacher Education, Simpson College



Heidi Berger Associate Professor Of Mathematics, Simpson College

Pre-service Teachers Representations of Using the Schoolyard to Teach

4:45pm - 5:10pm, Nov 5

25-minute Research Session

Schoolyard pedagogy involves learning experiences beyond the walls of the classroom. Our elementary science methods courses have been designed to showcase using the schoolyard as a venue for learning science for preservice teachers. This presentation will describe the ways pre-service teachers represent schoolyard pedagogy in self-drawings, written autobiographies and teaching philosophies.

View recording at:

https://zoom.us/rec/share/o-ieUybjUq5dM3Su1eAN8T9GvU7ujQ7V0QIsCPC269pCrHqOBCPx194JUL5RW-Al.H2JVoLMu-acu0EDd

Passcode: p^@bJ48V

Speakers



Kelly Feille Assistant Professor, University of Oklahoma



Stephanie Hathcock Associate Professor of Science Education, Oklahoma State University

5:20pm

Integrating Augmented Reality in Elementary Science Methods courses

② 5:20pm - 5:45pm, Nov 5

25-minute Regular Session

The presentation will consist of augmented and virtual reality (AR/VR) tools that were used as part of the elementary education science methods course at a teaching university. In this hands-on session participants will 1) get ideas 2) practice using the AR/VR technology and 3) discuss these tools and how they can be adapted into your own courses.

View recording at:

https://zoom.us/rec/share/TXSfxClAalAO6C607Rr9l10b8--x4vZEQBUPudrGqN_ugZH3igLPjPJ5XOvWVwoY.9FmiSGto7Ddzhub7

Passcode: 5CSfy6D=

Speaker



Sumreen Asim Assistant Professor, Indiana University Southeast

Science Outreach Bootcamp: Changing STEM Students' Outreach Practices through Interactive Webinars

② 5:20pm - 5:45pm, Nov 5

25-minute Regular Session

To view recorded session:

https://zoom.us/rec/share/SDS2CebRY-ZLsyvsMdKzZq7uYKaoKwNpA7wGxanQOw7dbul2hnKkUphxHmdYZ8S0. ntc4zuKseSch5oE7

Passcode: d*6uC@EJ

College students conduct a lot of science outreach with a variety of goals; however, learning outcomes or event evaluations are rarely considered. We developed a workshop series to help improve collegiate science outreach. This presentation will share our experiences, the workshop structure, and our research into the impacts on student motivation.

Speaker



Merryn Cole Assistant Professor of Science Education, University of Nevada-Las Vegas

Effects of Short-Term, Outdoor Interventions on Students' Attitudes and Academic Outcomes © 5:20pm - 5:45pm, Nov 5

25-minute Research Session

To view recorded session:

https://zoom.us/rec/share/Vy-ByWkWgQudZ1tKcmBmCjt6cW-qigEhwSKv3LCOSpGVPvxXPRnc0-q0LXV2GoY5.-H-BA3PdeS50HIEg

Passcode: huFnK=?0

Summer programs were investigated to determine the effects of nature-based pedagogies on PK-5 students' environmental attitudes and academic outcomes. The study used mixed methods including Likert-based student surveys and parent focus groups. Results suggest that short-term, nature-based programs can change students' perspectives toward nature while having varying effects on academic outcomes.

Speakers



Cameryn Veine Hope College



Stephen Scogin Assistant Professor of Biology and Education, Hope College

Supporting our Stakeholders: Parent Perceptions of Mathematics Education © 5:20pm - 5:45pm, Nov 5

25-minute Research Session

Recorded session:

 $\label{lem:https://zoom.us/rec/share/OTfCUyZOhlk_RpVoOWLAD-4NvVCNaS9afFPGrbNFWgaR1shvfpObleVQloGNTpLh9.3YWtaYPgC7cQcxLT$

Passcode: wKFZL@n2

This session will share results from a study seeking to investigate parental understanding of and involvement in their child's mathematics education in a suburban district. Quantitative and qualitative

analysis of a survey distributed to parents of students K-12 and the implications for supporting parents will be discussed.

♥ Speakers



Melissa Gunter Assistant Professor of Mathematics Education, Central Connecticut State University



Kate Raymond Assistant Professor, University of Oklahoma

Investigating changes in pre-service teachers' conceptions of technological literacy **②** 5:20pm - 5:45pm, Nov 5

25-minute Research Session

Recorded Session:

 $https://zoom.us/rec/share/u8Uh8ARTTizdH1lCcZyJUrbxQGBn1PbZlqan7G7MAxcGc9W5PUwo46TRvI_fnRmw.8G8SE8gshjHRXRSx\\$

Passcode: .j%9Pj4j

Recent standards within STEM education place an emphasis on helping students become proficient users of technology, but Selber (2004) calls for a more robust definition by adding a critical and rhetorical component. We sought to investigate how pre-service teachers' conception of technological literacy changes following an educational technology course using Selber's (2004) framework.

Speakers



Kean Roberts PhD Candidate Science Ed, Drake University



Jordan Holub Doctoral Candidate, Drake University

STEM Teacher Preparation for Elementary School: What do we know and not know? © 5:20pm - 5:45pm, Nov 5

Presidential Exchange

Recorded Session:

 $https://zoom.us/rec/share/2yueiSc8JsDQ3bfpQPv0PW75Rn3Gq1vbdgfFxUC6lDgbpYbJYr_9OeSqnl5us_lo.-QHEUvEkl-jmoBdg\\$

Passcode: z!pc8J0b

An extensive literature review of research on elementary STEM teacher preparation was conducted in writing a chapter for the Handbook of Research on STEM Education. Highlights of the research will be shared along with a group discussion of what we know, don't know, and next steps.

Speaker Speaker



Gil Naizer Professor, Texas A&M University-Commerce

6:30pm

Graduate Student Reception

4 6:30pm - 7:30pm, Nov 5

Join Zoom Meeting

https://zoom.us/j/92967480463?pwd=aUtDeWwrR1VDZnpybitsRk16NVh6UT09

Meeting ID: 929 6748 0463

Passcode: 761790

₹ Speaker



Suzanne Nesmith Associate Dean of Undergraduate Education, Baylor University School of Education

Fri, Nov 06, 2020

10:00am

The Impact of a Summer Mathematics Academy on Early Number: A Two-Year Case Study @ 10:00am - 10:50am, Nov 6

50-minute Research Session

To view recorded session:

https://zoom.us/rec/share/15e640NmyeLi6ahj-5JK_uAMJITRaL39j7cVf5pAh3tooXlLg4T3WZqnpsoz2GkL.ymMqUzkAla_kLi7z

Passcode: 6?D7rElj

Join us as we share results from a study conducted in conjunction with a summer mathematics academy for early childhood students. Focusing on early number sense, a classroom teacher along with preservice teachers led instruction. We will share our experiences related to designing the academy and discuss the impact of the academy on students who attended for two consecutive summers.

♥ Speakers



Ryann Shelton Baylor University



Keith Kerschen Assistant Professor of Education and Director of Field Experiences, Concordia University, Nebraska



Sandi Cooper Professor, Baylor University

Using Task Analysis as a Framework for Elementary Mathematics Methods Courses @ 10:00am - 10:50am, Nov 6

50-minute Regular Session

To view recorded session:

 $\label{lem:https://zoom.us/rec/share/dcPDet6QDsJw6zTl5uxm5Qksvf7JVZRcCtjQXASo5V-8XPlOHN22H0H2yvQ9M5U0. \\ fwPG2vQcw8iMeGgn$

Passcode: M5.o?Pn4

Without an organizing framework, elementary mathematics methods course can seem disjointed and overwhelming to students. Additionally, elementary education students often struggle to determine the quality of math tasks. Recognizing these issues, this session describes the development of a framework for elementary math methods courses that uses task analysis to connect pedagogical concepts.

Speakers



Valerie Long Assistant Professor of Mathematics, Indiana University of Pennsylvania



Kate Raymond Assistant Professor, University of Oklahoma



Nicole Gearing Assistant Professor of Elementary Education, Utah Valley University

The Effects of Nature-Based Pedagogy on PK-12 Students' Attitudes and Feelings of Well-Being @ 10:00am - 10:50am, Nov 6

50-minute Research Session

Recorded Session:

 $https://zoom.us/rec/share/4Pq-G_FqAcDoxtkjvier-2pA7ZzKO8YHc81SmVRsnkl810D6566\\ 0Rb00I_qwpo07.TtK4Qb1OoCnX4wDh$

Passcode: ^3pwA%cg

Researchers investigated nature-based programs to determine the effects on students' attitudes and feelings of well-being. Using mixed methods, six survey instruments were administered (n = 65) and 10 interviews were conducted. Data analysis is ongoing, but researchers predict that these programs will have greater impacts when compared to short-term programs from previous research.

♥ Speakers



Stephen Scogin Assistant Professor of Biology and Education, Hope College



Cameryn Veine Hope College

Computer Science and Mathematics In-Service Teacher Perspectives of Culturally Responsive Pedagogy

② 10:00am - 10:50am, Nov 6

50-minute Research Session

Session Recording:

 $https://zoom.us/rec/share/kdUEuQm0jsEXkql4TwLnjOb4_lz_fidzM0lmCDucTmTHVqYA1wMKeU0N41pbpeSR.zMApT7lFyL-DnAfD$

Passcode: J#Dt5R&x

This study aims to identify and understand the similarities and/or differences that exist among the culturally responsive perspectives of in-service Computer Science and Mathematics Teachers. Additionally, we examine incipient connections between the nature of computer science and the potential for implementing culturally responsive pedagogy.

♥ Speakers



Y. Rhoda Latimer Clemson University



Megan Che Assistant Professor, Clemson University

Innovating in Mathematics Teacher Education: Creativity in a Dynamic Landscape @ 10:00am - 10:50am, Nov 6

Presidential Exchange

Recorded Session:

 $https://zoom.us/rec/share/2yueiSc8JsDQ3bfpQPv0PW75Rn3Gq1vbdgfFxUC6lDgbpYbJYr_9OeSqnl5us_lo.-QHEUvEklimoBdq\\$

Passcode: z!pc8J0b

Math and science teacher education are facing unprecedented challenges in 2020. Interest in pursuing teaching is low, states are relaxing certification and continuing education requirements, and COVID-19 radically changed the work of teaching and teacher education. This presentation highlights innovative models to reshape teacher education and poses bold challenges to the field for the future.

♥ Speaker



Mike Steele President, Association of Mathematics Teacher Educators

Using Tutorial Virtual Manipulatives to Enhance Classroom Mathematical Discussion

2 11:00am - 11:25am, Nov 6

25-minute Research Session

To view recorded session:

 $https://zoom.us/rec/share/NUcO-tj5PciFDFba8wayO_nUEvDZK_3aS6dfKC-4s-R0-F2thxb6w_TsigleeRtp.Lr-6TYFRavLY2dlx$

Passcode: 8uM.Bd=3

Many teachers use tutorial computer applications to personalize instruction. But what if teachers could expand students' experience with these tutorials to create a community of mathematics learners? This session will share mixed methods results from a study examining how teachers leverage tutorial virtual manipulatives to support students' discussion and learning of mathematics as a community.

♥ Speaker



Katie Anderson-Pence Assistant Professor, University of Colorado Colorado Springs

Developing socially just science teachers: Lessons from an urban science teacher preparation program

11:00am - 11:25am, Nov 6

25-minute Research Session

To view recorded session:

https://zoom.us/rec/share/svn5omMkc0blexg8Rhl5289iBlecEQhv8ZcgWmKlHLuxozTH-llwby1aznA51J4J.AX4vGGBNVl1ClGiB

Passcode: 2b\$9MO9.

Research indicates predispositions determine teacher beliefs, despite experiences in preparation. This study was designed to explore the role of predispositions in teaching science for social justice. Findings indicated teacher engagement in structural critique was dependent on their prior beliefs, whereas they acquired beliefs and skills reflecting the individual orientation.

Speaker



Lisa Marco-Bujosa Assistant Professor, Villanova University

Preservice Teachers' Reflections from an Elementary Mathematics-Focused Integrated STEM Course

11:00am - 11:25am, Nov 6

25-minute Regular Session

Preservice elementary teachers enrolled in the third of a three-course mathematics sequence participated in a variety of STEM-integrated lessons. This session presents the themes, common elements, and lessons learned from journals written by students after each of the integrated lessons.

View recording at:

https://zoom.us/rec/share/gT0QSswudKYiAY8DwVqwf9yw9ku2URcMB3cN3x_UwkAO92Ed-CnOc2Mm7Qw4PQ8A.5PO_TKY_HScv11yS

Passcode: nTI66My=

♥ Speakers



Debbie Monson Associate Professor, University of St. Thomas



Rebecca Glover Assistant Professor, University of St. Thomas

Broadening the Problem-Solving Measures: Moving Online

2 11:00am - 11:25am, Nov 6

25-minute Research Session

This session describes outcomes from moving a series of validated mathematics problem-solving measure for middle-grades students from a face-to-face format to an online setting. The study compares students' outcomes from both settings and offers implications about moving face-to-face assessments online. Participants will learn about the assessment series, validity, and testing in online settings.

View recording at:

https://zoom.us/rec/share/_CErgamewO9pb2N1hWF5sShJVZDo9gXkhMJZBjcQkmQyfW9ZGiUXaDgvWBYZDLmR.uA8ZxZarLEVEfhiw Passcode: 4\$KrY#c4

▼ Speaker



Jonathan Bostic Associate Professor of Mathematics Education, Bowling Green State University

11:35am

A Comparative Study of Pre-service Teachers' Knowledge of Decimal Operations

11:35am - 12:00pm, Nov 6

25-minute Research Session

To view recorded session:

 $https://zoom.us/rec/share/lx9xYyo5J1HeLOTcmOeBHasyxERMa0H-64tliPR8f_J5SSLgB0YGRiL2u58gOxUP. \\ hshu0cyH2Er9X71o$

Passcode: X8FtkD@R

This study examined (a) the differences in pre-service teachers' procedural knowledge in four areas of decimal operations in Taiwan and the United States, (b) the differences in pre-service teachers' conceptual knowledge in four areas of decimal operations in Taiwan and the United States.

Speaker



Cheng Yao Lin Southern Illinois University

Educational Hydraulic Lift

② 11:35am - 12:00pm, Nov 6

25-minute Regular Session

For a STEM Center and Department of Engineering partnership, an undergraduate engineering student created a transparent, portable device enabling children to lift 400 pounds. During demonstrations in schools, middle school students measured pipe diameters and lever lengths with calipers and measuring tapes, and they understood ratios in a meaningful way by calculating mechanical advantage.

View recording at:

https://zoom.us/rec/share/yyBi3d-7uUzx9xX8_pU2eWrb1W-V1DjRg9UFofKwY98shRrljWUaXA_M0PAqOzPO.8TgvBp1YLrASBOig

Passcode: 30Hu#ixU

Speaker



Steve Elliott Professor, University of Tennessee at Martin

Automatically Generated Dynamic and Interactive Concept Maps

11:35am - 12:00pm, Nov 6

25-minute Research Session

To view recorded session:

 $https://zoom.us/rec/share/L2-8IGaoyR6IManVS4F6H3U5E-3MLi66p25FBf-sn2IbE9LPVNVMdRBMbHh_0gWx. \\ Bfp4hEwj1RcbTRxk$

Passcode: D8j\$XshR

Through five 1.5-hour PBL sessions, high school students learned college-level physics concepts related to fixed-axis rotation. They used Dynamic and Interactive Mathematical Expressions (DIME) maps, automatically generated interactive concept maps made possible through machine learning and natural language processing. DIME maps can make any textbook interactive.

♥ Speaker



Michael Rugh Graduate Research Assistant, Texas A&M University

Employing Modeling Practices to Investigate Preservice Teachers' Sense Making of Perimeter and Area

② 11:35am - 12:00pm, Nov 6

25-minute Research Session

Recorded session:

 $\label{lem:https://zoom.us/rec/share/t3JlxOrWa5xkW92TnHuW4_xluEFiKVVjAqpGg7px_Ldbwsl_gdNCrarlKw4KfSrE._RWu16_cDPvxahW$

Passcode: D60.L26.

In this session we address the research initiatives on how elementary and middle preservice teachers (PSTs)

make sense of perimeter and area concepts through modeling with mathematics practices and its impact on engaging young students in mathematical modeling. Our aim is to help mathematics educators and to develop the awareness and pedagogy of PSTs in mathematical modeling practices.

Speakers



Reuben Asempapa Penn State University-Harrisburg



Yasemin Gunpinar Assistant Professor of Mathematics Education, St. Catherine University



Derek Sturgill Assistant Professor, University of Wisconsin-Stout

Quality Online Tutoring: Preparing Pre-Service Teachers to Serve Rural Students

2 11:35am - 12:00pm, Nov 6

25-minute Research Session

Recorded Session:

 $https://zoom.us/rec/share/oONwP5JtwTqDgySXpTCqF32hoA9zmjrN9KUnS46fKRBXmTwYMA5c8yljBW5Kw467.XrnDJdUWnDeprTL_\\$

Passcode: H9.2A4gA

This study sought to improve and expand an online tutoring program currently in place at a teacher preparation institution. The results of this study have demonstrated how participation in this service-learning project benefits preservice teachers. This study also developed certain effective strategies for online tutoring.

♥ Speakers



Hsing-Wen Hu Professor, Coastal Carolina University



Grant Sasse Associate Professor, University of St. Thomas Houston

12:00pm

Artificial intelligence isn't a game show (but it should be)

12:00pm - 1:00pm, Nov 6



Keynote Session recording can be viewed using this link and passcode: https://zoom.us/rec/share/qEv7W8QIrJoMDINUaVrqYhzF7D82xo5URjBxau4q868_osyqEX5y6SRG6xgsTg2G.x9v4W5_P57Nuao4v Passcode: 9G&3j0j?

Keynote Presentation: Artificial intelligence is viewed as a goal in science (let's build intelligent machines) and in education (let's train software engineers to build smart assistants). Despite the serious implications for education, the economy and society, the most widely-accepted view of the end goal of Artificial Intelligence is a parlor game: a trivial "imitation game"

(known today as the Turing Test). Likewise, many of the watersheds in the public understanding of AI progress have been in frivolous games

like chess or go. Sometimes, they're a literal game show like Jeopardy! After discussing why existing game show exhibitions have given an inaccurate impression of how well we're doing with question answering, I'll discuss how we can use the skills and strategies of high school trivia competitions to improve the science of AI, communicate the limitations of AI, and to broaden participation in computer science and artificial intelligence.

♥ Speaker



Jordan Boyd-Graber Assistant Professor, University of Maryland

1:00pm

Defining the History of Mathematics

② 1:00pm - 1:25pm, Nov 6

25-minute Regular Session

Recorded Session:

 $https://zoom.us/rec/share/HVRSYyGsYf16-RwuscbW95WOLHwI4s0ZWsQwWo7YunTHhCFZrr3R7aWpkVVqh-9w. \\ RPpisAjqt2z8XKJX$

Passcode: C6x+=1+T

This session provides K-12 educators with resources and lessons for both primary and secondary mathematics classrooms in the area of mathematics history. Beginning with a unique autobiography experience, teachers will delve into the history of math based upon their individual curriculum.

Speakers



Amanda Cummings Doctoral Student, University of Oklahoma



Tonya Crowe Doctoral Student, University of Oklahoma

Using an e-portfolio to Document Program Mastery: An Analysis of Its Effectiveness @ 1:00pm - 1:25pm, Nov 6

25-minute Research Session

Recorded Session:

https://zoom.us/rec/share/SbrtXvDayRUtuiFOpCR4FUTGu0KdJ_PPdzo4GBcJvVRLvx121TS6enNjOomN 2WND.lq1xGPgjbGeP9iCc

Passcode: &.1TNsGa

The purpose of this session is to describe how an asynchronous M.Ed. in C&I program with an emphasis in mathematics education developed and implemented an e-portfolio assessment to document candidate mastery of program objectives. E-portfolio evaluation data will be discussed. Implications for program development will be discussed.

Speakers



James Telese Professor of Mathematics Education, University of Texas, Rio Grande Valley



Gregory Chamblee Professor, Georgia Southern University

Enhancing Spatial Secondary Students Abilities Through Exposer To Computer-Aid Design Software

2 1:00pm - 1:25pm, Nov 6

25-minute Research Session

To view recorded session:

https://zoom.us/rec/share/TXeIXVVAXyR7aX0iPHQgvjnQlfE-Gf6umxb5cUgGTYDMZobcflboQEAt4Eu2Ksxl.jcT3tjVJ5Q07NiYl

Passcode: um2zS%i9

Spatial ability has been recognized as an indicator of STEM success. The present study investigates how computer-aid design software can enhance spatial ability. Results showed statistically significant difference between pre and post test scores with a Cohen's d effect size of 0.81. It can be concluded that utilizing these technologies can aid in developing and improving spatial abilities.

Speaker



Ashley Williams Graduate Instructor, Texas A&M University

Computational Thinking Using the First in Math Online Program

1:00pm - 1:25pm, Nov 6

25-minute Research Session

To view recorded session:

 $https://zoom.us/rec/share/whZiqSShT11uwl14rlHdm0nyc8Ug69bZ0_fUudUabyRDX4WkjliGhLalCGkcunAb.lCQ_r-l-37CHFd3t\\$

Passcode: L8r\$2U&1

Students demonstrate many of the component parts of computational thinking skills in a variety of disciplines, such as mathematics, science, and computer science education. Computational thinking is an approach to problem solving--the primary purpose for learning mathematics--that can be implemented with a computer.

Speaker Speaker



Lynn Columba Associate Professor, Lehigh University

Raising STEM Career Awareness through Informal STEM

1:00pm - 1:25pm, Nov 6

25-minute Research Session

Despite the increasing need for STEM workers, the number of students who pursue STEM majors is decreasing. This presentation discusses a study that used Social Cognitive Career Theory to examine the extent to which middle school students' experiences at a STEM informal summer learning experience influenced their interest in STEM careers.

recording with viewers:

https://zoom.us/rec/share/U6KV2Cr1wQw6bjWbQcGei4m1Rl38gEQ_sMzOWtpKl3mShLh9hpOfwMubumZRm0W0.duHRHBs4ohmSdL4V Passcode: 9&jb+E.6

♥ Speakers



Cathrine Maiorca California State University, Long Beach



Thomas Roberts Assistant Professor, Bowling Green State University



Christa Jackson Associate Professor, Iowa State University



Sarah Bush Associate Professor, K-12 STEM Education, University of Central Florida



Margaret Mohr-Schroeder University Of Kentucky

1:35pm

Examining the Relationship Between Affective Factors and Students' Grades

O 1:35pm - 2:00pm, Nov 6

25-minute Research Session

The purpose of this study was to examine the relationship between affective variables and students' course grades in an introductory statistics course. A structural equation modeling was used to examine the relationships between the affective factors and students' grades.

View recording at:

 $https://zoom.us/rec/share/1E4hsmgcqp1B9flaJQEcOw7KW0hf3tR34358rDu_QCtPxmYfRzQMUBSIPCheSJht. \\WRizIx7e6v2n29W8$

Passcode: xj3.=8JH

Speaker



Abraham Ayebo Assistant Professor, University of Minnesota Rochester

Elementary Partnership Integrated Coaching (EPIC) in STEM Framework

1:35pm - 2:00pm, Nov 6

25-minute Regular Session

To provide elementary students with meaningful and authentic opportunities to engage in STEM learning, it is critical to develop elementary teacher content and pedagogical content knowledge in STEM subjects. This regular session shares an innovative, content-focused STEM coaching framework that intentionally and systematically supports the learning of both pre-service and collaborating teachers.

View recording at:

https://zoom.us/rec/share/MzNCP4xA6Y5-SXKwSXLV9ZAR-gK6L1YnwgrlOeixz-Hlht58mToO3WAQ0vwVAf_N. jdx94iiSRKSgWSUM

Passcode: miE@8R.J

♥ Speaker



Karl Jung Assistant Professor, Science Education K-8, University of South Florida College of Education

Refining explicit-reflective questioning by examining responses to different NOS question types

② 1:35pm - 2:00pm, Nov 6

25-minute Research Session

Although explicit-reflective NOS instruction often consists of questions drawing students' attention to NOS ideas, there is little research about the structure of those questions. This study examines the nature of student written responses to different NOS question types (e.g., convergent, divergent). We'll discuss potential pedagogical implications of different question types.

View recording at:

https://zoom.us/rec/share/-Mdsg3HZHfZ08hqpjDWBFnlZGNtqRCgGsq6KbFOU-UiiNxNRPodl7-MKLTinXjVQ.zJwhD7W-ZOXPdkSf

Passcode: %!6i^C&t

Speaker



Sarah Voss Doctoral Student, Drake University

A STEM Circle Approach with Multilingual Students and Families

1:35pm - 2:00pm, Nov 6

25-minute Regular Session

To view recorded session:

 $https://zoom.us/rec/share/Tu_Aa6lO1Xkb0Ta9onv4KXpsD-te7XryPaQpM9OWvvF4qcKb4203LG8uEqZ9htbp.i0lbsU26WAxlvyGR\\$

Passcode: R9!^v=un

We will do a classroom activity demonstrating how STEM Circles employ active learning with challenging curriculum, multiple learning approaches, and an inclusive school environment.

♥ Speaker



Alan Zollman Professor, Indiana University Southeast

Empowering Middle School Intervention Students to Love Mathematics

1:35pm - 2:50pm, Nov 6

75-minute Workshop

To view recorded session:

 $\label{linear_hydro} https://zoom.us/rec/share/t8p4H_xgvv_V-41Ve7AJnq70QXiHATRMyOSLfpCGfgX0drrbdpSjK7KJD6X3NQ_s. zZ77WbqlyjQs2OxJ$

Passcode: YTX^kXp4

This session will engage participants in a nontraditional, conceptual based, middle level mathematics intervention curriculum that focuses on collaborative problem solving, discourse, and creating mathematical communities through rich mathematical tasks with a high level of cognitive demand. Data collected and analyzed from the first two years of curriculum implementation will also be examined.

♥ Speaker



Lisa Amick Clinical Associate Professor of Mathematics Education, University of Kentucky

2:10pm

Affording Pre-Service Middle Grades Mathematics Teachers' Understanding of Definite Integrals

② 2:10pm - 3:00pm, Nov 6

50-minute Research Session

Recorded session:

https://zoom.us/rec/share/25bsxISSMsaVEc4EwZMIMyxzI42Di9XozdQSbRGP3ucovz6jPy5IUkcemL9z6bJa.ORPeLxSmSjXEKcW5

Passcode: E3a#FPT4

This phenomenological study explored the experiences of 14 pre-service middle grades mathematics teachers participating in a lesson designed to help them conceptualize definite integrals while using a GeoGebra applet. Four categories of features within the GeoGebra applet were identified with one type providing an explanation for what was possibly helping and hindering student understanding.

Speaker



Emma Bullock Assistant Professor, Sam Houston State University

3- Minute Thesis

2:10pm - 3:00pm, Nov 6



Recorded Session:

https://zoom.us/rec/share/ATS_zKBOLovxaA1epd1gBDqDac1XewWOn8eqPyHCPRfUWkIS-PmzAqgAvQ3sjblc.ynqWkGczQmbLM-4d

Passcode: \$&5X3\$^m

5 Subsessions

- STEM Self-efficacy and the Pursuit of STEM: A Three Article Dissertation
 2:10pm 3:00pm, Nov 6
- Informal Science Field Trips and their Link to Curriculum
 2:10pm 3:00pm, Nov 6
- The Impact of Professional Development Program on Designing a Coherent Curriculum

② 2:10pm - 3:00pm, Nov 6

 The Ins and Outs of a Undergraduate Student Learning about Statistical Knowledge for Teaching

2:10pm - 3:00pm, Nov 6

 Quantifying the Habitat Use and Preferences of Spawning Sockeye Salmon: A Case Study in Alaska

2:10pm - 3:00pm, Nov 6

Rethinking How We Assess Prospective Teachers' Ability to Coordinate Fractional Units 2:10pm - 3:00pm, Nov 6

50-minute Research Session

Recorded Session:

 $https://zoom.us/rec/share/A-q9ko4eUOEc52ns-cz3cpndcPBYR9f9SRrX-56EmhjU6r-9tHxV8lxMiwU8SO24.\\ 3daul1PdxqIIFZWr$

Passcode: Ez4XVH&&

This session shares results from a study that initially set out to investigate the effects denominators and representation types have on prospective teachers' fraction understanding. During pilot data analysis, typical assessment methods for unit coordination were found to be flawed and in need of structural change. Those flaws and the resulting changes are discussed.

♥ Speakers



Richard Busi James Madison University



Alexis Stevens Associate Professor of Mathematics Education, James Madison University



Jenny Gibson Instructor, James Madison University



LouAnn Lovin Professor, James Madison University

The Other First Days of School

② 2:10pm - 3:00pm, Nov 6

50-minute Research Session

Recorded Session:

 $https://zoom.us/rec/share/KSDG5tP3U-gQG52LY1aOADqasPMPCNulShfDXW8EPkCcsD3JY3HFLeTLXrAomTpy. \\ UkwQTHI-dV7I5IyR$

Passcode: uc.8cbV3

The first days of school for many teachers can be deemed a critical time of the school year. As pressures mount to perform on high-stakes tests, teachers are often encouraged to employ top-down approaches for managing their classrooms. The research examines two high school mathematics teachers and how they approach the first days of school using democratic practices.

▼ Speakers



Cacey Wells Assistant Professor, Appalachian State University



Stacy Reeder University of Oklahoma

3:10pm

The Influence of STEM Teacher Professional Development on Teaching Efficacy

② 3:10pm - 4:00pm, Nov 6

50-minute Research Session

To view recorded session:

 $https://zoom.us/rec/share/pdUd3sseTJUsvtM7JPLEQKNg252jc4OOZLCXwqiiqxBbrzP3CmRHEa9RtmS1-kEP.yOfmMqTl65OHL6_I$

Passcode: zHc8ij#S

For the past eight years, University faculty and informal science educators have collaborated to deliver model activities in STEM areas during week-long Summer Teacher workshops for K-12 educators. The workshops center on empowering teachers to develop their own inquiry-based STEM lessons. Current data on how this opportunity has influenced teacher efficacy in STEM subjects will be shared.

Speakers



Jessica Marcolini Instructor, Florida Gulf Coast University



Susan Cooper Assistant Professor, Florida Gulf Coast University

Infunity, Putting Some Fun Into Infinity

② 3:10pm - 4:00pm, Nov 6

50-minute Research Session

To view recorded session:

https://zoom.us/rec/share/ZtcUV8SIrnXCC8HXRO03zrWM9DlskUQc1aGNipAE048Sbtn1M6ZapOYb5ntiN0Kh.sPdLulA64T3KpzAD

Passcode: z3!1aU?=

Did you know infinity comes in more than one size?! Infinity is a crucial concept in many areas of mathematics, yet is often underappreciated for what it has to offer pedagogically. Join this session to learn a variety of illustrations, historic contexts and online sources we use in class to help student better appreciate this amazing concept. It's not just a really big number!

Speakers



Chuck Emenaker Professor, University of Cincinnati Blue Ash



Yalcin Karatas Assistant Professor, University of Cincinnati Blue Ash

Is problem posing a problem? How to facilitate problem posing in real classrooms ② 3:10pm - 4:25pm, Nov 6

75-minute Workshop

Problem posing is growing in popularity among researchers. However, there is little in the literature that provides teachers with guidance on how to incorporate this strategy in their classrooms. This session will provide a brief overview of existing research on problem posing and introduce practical strategies for incorporating problem posing in elementary classrooms and with preservice teachers.

View recording at:

https://zoom.us/rec/share/eLMeCWnEy_23Zpktdi_L48Mb86qWgcSzylc6pV7m9xqNPm1UQ ZOvZqEVkqA46qKe.g-74t3BrnLjVnwHj

Passcode: \$bSj?U3A

♥ Speakers



Julia Calabrese Texas A&M University



Danielle Bevan Texas A&M University



Mary M. Capraro

Using Self-Explanation and Think Aloud Protocols to Develop Preservice Teacher TPACK @ 3:10pm - 4:00pm, Nov 6

50-minute Research Session

This session presents a qualitative case-based research study assessing the integration of think-aloud and self-explanation protocols to promote deeper processing of TPACK for preservice teachers investigating the intersection of STEM content and affordances of modeling and simulation technologies. Between-group comparisons are made for the quality of self-explanations with and without prompts.

View recording at:

https://zoom.us/rec/share/W92NejYqRrCMpYiLleWkoCDJnuJ2n2CkjFlh-iBXB3-mJdvcfB8F2TZuDr_AJGTw.J6xjtQHuYaMsYr9n Passcode: #Jf9XN%p

▼ Speakers



Ginger Watson Associate Professor, University of Virginia



Mary Enderson Associate Professor, Old Dominion University

Common Fractions as Springboard for Elementary-School Students' Learning of Fractions @ 3:10pm - 4:00pm, Nov 6

50-minute Research Session

This study investigated whether common fractions are used in comparison tasks involving uncommon fractions and found that educated adults frequently match an uncommon fraction with a common one having a similar value. It is suggested that the few common fractions, namely, 1/4, 1/3, 1/2, 2/3, and 3/4, be used as a springboard for elementary-school students' learning of fractions in general.

View recording at:

 $https://zoom.us/rec/share/IhrYCPTgKwqBM8P2cUu73J_URp8hlyu2Xfek-GusUwAzFTl9rEiY4EKS03XgOVtV. \\ NURF7HD4tjTmbBFu$

Passcode: x52QH@St

♥ Speaker



Fuchang Liu Professor of Math Education, Wichita State University

4:10pm

Examining Content and Pedagogical Knowledge of Pre-Service Elementary Grades Mathematics Teachers

4:10pm - 4:35pm, Nov 6

25-minute Regular Session

The presentation examines content and pedagogical knowledge of pre-service elementary grades teachers. Data came from interviews conducted with students enrolled in a mathematics course for pre-service teachers. Protocols examined: (1) Connections that teachers make between their mathematical content and pedagogical knowledge; and 2. Documentation of these connections in illustrative examples.

Share recording with viewers:

 $https://zoom.us/rec/share/g9A9oh12xtwSVBVRDsNjL3iv4N_gM0ocugwg6CypkCHFmCm-hKYwoongyg19Yqyz.ttJPNLGp3SR85OXC$

Passcode: E4O2%q6p

Speaker



Victor Cifarelli UNC Charlotte

Essential Elements for Science: Reaching and Teaching Special Education Students @ 4:10pm - 4:35pm, Nov 6

25-minute Regular Session

To view recorded session:

https://zoom.us/rec/share/paasZEytblKen4wtYXzI-Enz2VSLi701Z2ZtnfLMqQaxYS3z6LPN21WuKPvA09Pc.r7QOW6G1Pfz04k4P

Passcode: !6da2yS7

A district shares the process of creating curriculum and resources for students on alternate assessment using the Essential Elements. The Essential Elements for Science address a small number of science standards, representing a breadth, but not depth, across the NGSS standards with the purpose of building a bridge from general education science to students with significant cognitive disabilities.

Speaker



Ashley Delaney Heartland AEA - Iowa DE

How to Publish in the School Science and Mathematics Journal @ 4:10pm - 4:35pm, Nov 6

25-minute Research Session

Recorded Session:

https://zoom.us/rec/share/aLRTj-gtnnzxSlfyoJQx912W2sYb6LheUc2m-k4EOPQK95y3JPO1BP-lvfFp2q9v.K58-Jsfjba75_y2Z

Passcode: E0!GnaW@

This session will provide an overview of the requirements for publishing in the School Science and Mathematics journal, as well as tips for increasing the chances that manuscripts will receive positive reviews. The SSM Research to Practice online companion publication options will also be discussed.

Speakers



Carla Johnson Executive Director and Associate Dean, NC State University



Margaret Mohr-Schroeder University Of Kentucky

The alignment of teacher created online curricula to mathematical modeling @ 4:10pm - 4:35pm, Nov 6

25-minute Research Session

To view recorded session:

 $\label{lem:https://zoom.us/rec/share/5TXd8NTB1CoMaT1HqtMF0GaV9GweeC-RiTWwcg8IYetDwHq_Gql0vMz4R8bKfl.QC7CcDOJjSDXPQ_N$

Passcode: *qdG7^G.

The purpose of this study was to investigate the alignment to mathematical modeling of teacher created activities available through the Teachers Pay Teachers (TPT) website. The TPT website, where teachers can buy and sell resources, is used by millions of teachers each year.

▼ Speaker



Micah Stohlmann Associate Professor, University of Nevada, Las Vegas

Development of Draw an Engineer with Applications of Math and Science Rubric for use with Teachers

2 4:10pm - 4:35pm, Nov 6

25-minute Research Session

Recorded Session:

 $https://zoom.us/rec/share/2GkehNRcKhz9IAv_EzQJDz7-Cjb1FWIiCqo5yyYw4_-07stvqH6vVLOTuSVstAXj. \\ q9LVELFsAt7mbVZL$

Passcode: rbyP6A&?

Drawings can be used to explore prospective and in-service teachers views related to the work of engineers and how engineers use math and science; however, rubrics designed for use with elementary students are

not sufficient for use with adults. Presenters will share their work related to the development of the Draw an Engineer with Applications of Mathematics and Science Rubric (DEAMS-R).

♥ Speakers



Rebekah Hammack Assistant Professor of K-8 Science Education, Montana State University-Bozeman



Toni Ivey Associate Professor, Science Education; Co-Executive Director, School Science and Mathematics Association; Associate Director, Center for Research on STEM Teaching and Learning, Oklahoma State University



Juliana Utley Professor and Morsani Chair in Mathematics/Science Education, Oklahoma State University

4:45pm

Argumentation in University Biochemistry Education and a New Model to Promote Critical Thinking

4:45pm - 5:10pm, Nov 6

25-minute Regular Session

Recorded Session:

https://zoom.us/rec/share/F1LrqbSKsgx6Q-xd6GBoP7Y0Bj99JMpBm092im0tCqKK1MQqEa-3rlkQSKkjzGKS.4HangEr64vdJey0B

Passcode: Eb@**@05

Biochemistry lectures are inefficient in cultivating critical thinking skills and argumentation. We propose a review to determine how argument occurs in university biochemistry classrooms and emerging themes upon implementation. We suggest an argument model that emphasizes argument theory and emphasizes relevant experiences to foster a purposefully connected approach to understanding biochemistry.

♥ Speakers



Katherine Sharp Graduate Research Assistant, University of Kentucky



Rebecca Krall University of Kentucky

Patterns of Number Words and Their Compatibility with Numeral System

4:45pm - 5:10pm, Nov 6

25-minute Research Session

Recorded Session:

https://zoom.us/rec/share/WkmgFchdcwdpXxaPgomaLWSgjzHJDbOEJvxaShr64TFgiP71J4DJk546_oUKeGPX.MNrd_YcSrvsEwu7M

Passcode: 0q7*pW?.

Different languages present different patterns of number words. We report findings from a pilot study involving preservice elementary teachers' experience in anticipating sequences of number words of invented languages, identifying their corresponding numeral systems, and implementing them in multiple counting scenarios.

Speaker



Hartono Tjoe Associate Professor of Mathematics Education, Penn State University

Preservice Elementary Teachers' Experiences Teaching with Different NOS Contexts

4:45pm - 5:10pm, Nov 6

25-minute Research Session

To view recorded session:

https://zoom.us/rec/share/-

tbCylRc8mZDlUOzF3I5hV6YLjv9w3YJfUV1vjBJkDzcBr4FY1UajyBF1oCMT_UF.AQPRDhSIOKJk4-VM

Passcode: 7=@\$tFtH

This study sought to shed light on preservice elementary teachers' (PSETs) thinking after implementing two approaches to teach NOS. Focus group interviews were conducted with the PSETs after they taught blackbox and historical short story lessons to groups of 6th grade students. PSETs favored black-box activities hands-on nature, but noted short stories likely resulted in greater NOS learning.

Speaker



Jordan Holub Doctoral Candidate, Drake University

Serving as a Reviewer for the School Science and Mathematics journal

4:45pm - 5:10pm, Nov 6

25-minute Research Session

To view recorded session:

https://zoom.us/rec/share/bYgvnRXjW6lldUCwdviPN34uTCDrKStqRAzoW-0LuOFDzrVBdENYf1iIY8wV75Yi.HmnPmA0xSiKPe79i

Passcode: dAgi&v0J

This session will provide an orientation regarding how to become a reviewer for the School Science and Mathematics journal. The editorial team will share best practice tips on how to complete reviews and overall information about the journal.

Speaker



Carla Johnson Executive Director and Associate Dean, NC State University

Literacy and representations in mathematics: Item analysis of standardized mathematical @ 4:45pm - 5:10pm, Nov 6

25-minute Research Session

This session details a question item analysis of the State of Texas Assessment for Academic Readiness (STAAR) exams conducted to determine if a relationship existed between mathematical literacy, multiple representations, and correct response. Focus was concentrated on algebraic items across multiple exams for the use of various mathematical representations in item prompts and answer selections.

View recording at:

https://zoom.us/rec/share/iGJZYK2-NVjKVJg3eGyTRUduw-61kMAT1dnSdRBTDtiHNfh6RvOy52aJ 2VNOqNAt.qKNptTo7yiq7Jftc Passcode: !+*NH8ru

Speakers



Shirley Matteson Interim Associate Dean for Research and Staff/Faculty Development, Texas Tech University



Audrey Meador Assistant Professor of Mathematics, West Texas A & M University

Presidential Exchange

2 4:45pm - 5:35pm, Nov 6

Presidential Exchange

View recording at:

https://zoom.us/rec/share/_2Bf7bqHblxdBqv7KDFW5g90E57Y2vFF0Tc8NDcV9beo4pKiAtnz8FNpN-uESZKn.ig5-tmPC0Op-S4m2

Passcode: qQ646?u&

Speaker



Suzanne Nesmith Associate Dean of Undergraduate Education, Baylor University School of Education

5:20pm

Analysis of Affective Mathematics Engagement with Hierarchical Linear Modeling (HLM) © 5:20pm - 5:45pm, Nov 6

25-minute Research Session

This study examined the student-and school-level variability of the students' affective mathematics engagement using Hierarchical Linear Modeling (HLM). Besides the significant effect of students' demographic factors (i.e., gender, home language, and immigration status), the school economic disadvantage status was a significant factor that impacted students' affective mathematics engagement.

View recording at:

https://zoom.us/rec/share/_t7RgCNbJTcOM9yuo3RTD9zSbQEiZMJFT6fMxWrD9JPeA_UACsil5Chixfrcmo1X. 6kJ2isPZnBK-E9aR

Passcode: 44#FhFMy

♥ Speakers



Yujin Lee Assistant Professor, University of North Dakota



Robert M. Capraro Co-Director, Aggie STEM Center



Mary M. Capraro



Ali Bicer Assistant Professor, University of Wyoming

Mathematics Educators & Career Technical Educators Enacting Project-Based Instruction © 5:20pm - 5:45pm, Nov 6

25-minute Research Session

To view recorded session:

https://zoom.us/rec/share/paasZEytblKen4wtYXzI-Enz2VSLi701Z2ZtnfLMqQaxYS3z6LPN21WuKPvA09Pc.r7QOW6G1Pfz04k4P

Passcode: !6da2yS7

Our presentation focuses upon three research questions and the self-reporting of secondary mathematics educators and career technical educators engaged in project-based instruction that engaged students in understanding autonomous vehicles. Results from monthly professional learning community meetings will be shared. Results include how much students engaged in project-based learning.

♥ Speakers



Tod Shockey Professor, University of Toledo



Charlene Czerniak Research Professor, The University of Toledo



Thehazhnan Ponnaiyan Lecturer, The University of Toledo



Preservice Teachers' Reflections on Students' Math Assessments Results and Interview Responses

2 5:20pm - 5:45pm, Nov 6

25-minute Regular Session

In this session, I will share a mathematics project work in which preservice teachers designed grade-level mathematics tasks to assess students, and interviewed them to understand their thought processes. Discussions on the mathematics tasks, students' solutions, and preservice teachers' reflections can be helpful not only to teacher educators but also to mathematics teachers and students.

View recording here:

https://zoom.us/rec/share/VfSrJuBHopPK7aw_b1ZFuSCoh1_IZNXG53pQZzVCAMdgyAfKWhegJshys-MwYflT.wzR9T5rJFc9D2WHY

Passcode: *VS81dvf

₹ Speaker



Nii Tackie Assistant Professor, University of Louisiana at Lafayette

Exploring How Secondary Science Teachers with Over Five Years of Experience Stay Effective © 5:20pm - 5:45pm, Nov 6

25-minute Research Session

To view recorded session:

https://zoom.us/rec/share/YZyfLaE6AY44HmQe6EayPtOb5TqpOLSY09VOR9zxbuQe5c4nRUX7rf3qLpuJEg.0vdXIaUi3PI7P6d5

Passcode: I\$+T3sA5

While many studies have explored factors related to success and barriers of teachers developing effective pedagogical practices, few studies have explored how and why science teachers became and maintained being effective. This study sought to qualitatively explore common factors among known effective science teachers to shed light on how these teachers have stayed effective in 5 years or longer.

♥ Speakers



Jesse Wilcox Assistant Professor of Teacher Education, Simpson College



Sarah Nolting Undergraduate Student, Simpson College

5:45pm

Committee Meetings

② 5:45pm - 6:15pm, Nov 6

7 Subsessions

Awards and Endowment

② 5:45pm - 6:15pm, Nov 6

Conventions

② 5:45pm - 6:15pm, Nov 6

Finance

② 5:45pm - 6:15pm, Nov 6

Membership

② 5:45pm - 6:15pm, Nov 6

Nomination and Election

② 5:45pm - 6:15pm, Nov 6

Policy

② 5:45pm - 6:15pm, Nov 6

Publications

② 5:45pm - 6:15pm, Nov 6

Sat, Nov 07, 2020

10:00am

Business Meeting

10:00am - 10:50am, Nov 7

View the recorded session:

 $https://zoom.us/rec/share/HqxZvagCd1Uzz7fm72tcYQ8zkeXShsUB0XpTg5QWtaNwP6mts-NgNpQ8hXm-RfLg.HzGOgn-5EjeQBcd_\\$

Passcode: #wSd^^#3

11:10am

SSMA Past Presidents

② 11:10am - 12:00pm, Nov 7

Presidential Exchange

This session does not have a recording.

♥ Speaker



Suzanne Nesmith Associate Dean of Undergraduate Education, Baylor University School of Education

Investigating Science Discourse Practices of Emergent Multilingual Learners using SALT ② 11:10am - 12:00pm, Nov 7

50-minute Research Session

To view recorded session:

 $https://zoom.us/rec/share/QmFFDZwzL3poypMqltk2Zu9gwP_JU4zIPmHNjxKNWildMsqwS_8Rgk3kguJVIYWo.i5kEfOhVHIhjwnK5$

Passcode: 2G.5acc

This study explores the use of Systematic Analysis of Language Transcripts (SALT©) software for coding and analyzing Emergent Multilingual Learners' (EML) written English to describe doing vs. learning science. Student journal entries provide evidence of expected differences in describing the two types of writing. Examples of journal entries and analysis will be shared.

▼ Speakers



Daniella Biffi Research Assistant, Texas Christian University



Callie Price Senior Instructor & Lab Coordinator , Tarleton State University



Kathy Horak Smith Assistant Professor, Tarleton State University



Cecilia Silva Assoc Prof, TCU



Molly Weinburgh Director: Andrews Institute of Mathematics & Science Education, Texas Christian University

Nonequivalent Definitions and Student Conceptions of Tangent Lines in Calculus

② 11:10am - 12:00pm, Nov 7

50-minute Research Session

Recorded Session:

 $\label{lem:https://zoom.us/rec/share/90oxYj86TVm0qtcP3kUxiQHO_44zgM6ebCn0Zy53hWeB4rYPOV1R_EeNRj3TOR0a.eWonHFfbSxDG7b3K$

Passcode: 8eDy?&&c

Tangent lines are typically first introduced in geometry. In calculus, tangent lines are again reintroduced with the standard definition, dependent on the derivative. This presentation will examine the impact of previous definitions of tangent lines on calculus students' understanding of tangent lines and examine how these conceptions impact student comprehension of tangent lines in calculus.

♥ Speakers



Mark Hogue Slippery Rock University



Dominic Scarcelli Graduate Student, Slippery Rock University

Achieving the Promise of Inclusive Science Education

② 11:10am - 12:00pm, Nov 7

50-minute Research Session

Recorded Session:

 $\label{linear_https://zoom.us/rec/share/2GkehNRcKhz9IAv_EzQJDz7-Cjb1FWliCqo5yyYw4_-07stvqH6vVLOTuSVstAXj, q9LVELFsAt7mbVZL$

Passcode: rbyP6A&?

The Next Generation Science Standards (2013) call for egalitarian access to science education based on the premise that all children can learn science including students from underrepresented groups with special needs. This session seeks to illustrate research using Universal Design for Learning (UDL) to develop curriculum, disciplinary literacy and assessments in inclusive science classrooms.

Speakers



Michele Koomen Associate Professor, Gustavus Adolphus College



Teresa Shume Assistant Professor, North Dakota State University



Jonte' (JT) Taylor Pennsylvania State University

Teaching Mathematics for Social Justice: Course Design and Resources

② 11:10am - 12:00pm, Nov 7

50-minute Regular Session

Recorded Session:

 $https://zoom.us/rec/share/zKqRA7sYTNAZZizEDfb5HV8MRhUCgbSCzb_oATeZuSuyo1z1w-cmnlcHb4otv0EM.\\bMVgfLk5OXw39YbV$

Passcode: ^VBmCU67

Teaching mathematics for social justice can be both a meaningful and challenging endeavor. Navigating discussions with students during this time of heightened political bipartisanship can be particularly difficult. We will provide an overview of courses designed for both graduate mathematics education students and undergraduate teacher candidates. Resources used in the courses will also be shared.

♥ Speakers



Stacy Reeder University of Oklahoma



Cacey Wells Assistant Professor, Appalachian State University

Enhancing Prospective Elementary Teachers' Ability to Pose Multistep Arithmetic Word Problems

11:10am - 12:00pm, Nov 7

50-minute Regular Session

Recorded Session:

https://zoom.us/rec/share/ZwbLilQqz7KZYA3RhcpAupYyLXZg6VsvKeeefOvESih6BQS7ZwEP8NTy0v5b6lrY.1LxnkuVR2WrU7v2W

Passcode: =rsDt2.6

Posing multistep arithmetic word problems is a challenging task for most K-8 teachers and little is known about how this skill is developed. This presentation highlights strategies implemented in an undergraduate problem-solving course for prospective K-8 teachers to facilitate their development of problem-posing skills within a deeper, more conceptual study of the four arithmetic operations.

♥ Speakers



Ashley Williams Graduate Instructor, Texas A&M University



Rachael Welder Texas A&M University

12:10pm

The Nature of Critical Self-Reflexivity in Mathematics Education and Computer Science Education

12:10pm - 1:00pm, Nov 7

Presidential Exchange

To view recorded session:

https://zoom.us/rec/share/G3eos3UNaX4Y7nuAr8vD7tMwTvaMkkVyrgQsYfiDo9DmA6YKRyCa6S36UIl8G4Tr.RwqVXWCKVXEGMFXa

Passcode: 6B*a6!eM

This session invites questionings and conversations around the nature of critical self-reflexivity. As an initial entry point, I will share current discourse from mathematics education and computer science education relevant to culturally responsive pedagogy, focusing on the tenet of developing critical self-reflexivity.

♥ Speaker



Megan Che Assistant Professor, Clemson University

Examining the Development and Use of Guided Notes in a Math Content Course © 12:10pm - 1:00pm, Nov 7

50-minute Research Session

To view recorded session:

https://zoom.us/rec/share/6oUVRGsIuTWHk928yKohDPqWXDbeHFX4ikD7GoFW3R8kt1bJezUZaj22z_rwcCFB .eAZ1ShIADsR-XMBN

Passcode: 6@BPGp9i

This collaborative, pedagogical action research study explored the use of guided notes in a foundational mathematics content course for pre-service elementary teachers. The purpose of this study was for professors in the mathematics and education departments to collectively develop, implement, and examine guided note structures, vocabulary, and problem types used in course-based guided notes.

♥ Speakers



Amy Ray Assistant Professor, Sam Houston State University



Emma Bullock Assistant Professor, Sam Houston State University



Mary Swarthout Associate Professor of Mathematics Education, Sam Houston State University



Julie Herron Associate Dean, Colllege of Education, Augusta University Full-time

Engaged Scholarship and the Pathways to Curriculum Development

② 12:10pm - 1:00pm, Nov 7

50-minute Regular Session

Engaged scholarship allows scholars the opportunity to research and serve while making a difference in the communities where they live and work. See how engaged scholarship provided the opportunity for two doctoral students to bring new curricula to life for two community partner middle schools.

View recording at:

https://zoom.us/rec/share/fadamTdl_o4Gi8rj-nbVe5BMGjPEi6dMKMXSmb03qyCoiT6Ym9w-2Nn9y_7YixXQ. tap0zaFPqw8lWzL1

Passcode: aJO0n\$7=

Speakers



Linda Smith Media/STEM/Technology Specialist, Texas Tech University



Sara Isacco 5th Grade Student Teacher Cooperating Teacher, Butler Area School District

The Development of Teacher Noticing for PSTs in a Varied Field Experience

12:10pm - 1:00pm, Nov 7

50-minute Research Session

This session reports on the development of preservice elementary teacher noticing during a summer mathematics academy for children from low-socioeconomic populations. The authors share the analysis of data collected before, during and after the varied field experience.

View recording at:

https://zoom.us/rec/share/ZXojgv7UITQ7bkAWxpBf7laYpfgzj7YyO2q4dNcfRLjAzQ3jLpl28M4O6imb72tR.PFWVXPsBhLNPcEVt

Passcode: bL=d2%jL

♥ Speakers



Sandi Cooper Professor, Baylor University



Melissa Donham Baylor University



Kenley Ritter Doctoral Student, Baylor University

Chopped Challenge: A Unique Approach to Enhancing Preservice Teachers' Lesson Planning Competencies

12:10pm - 1:00pm, Nov 7

50-minute Regular Session

An active, inquiry-based lesson planning experience was integrated within an elementary science methods course. The experience was based on the Chopped television series and focused the preservice teachers on each unique element of the 5E lesson cycle. In this session, an overview of the experience, activity examples, and the preservice teachers' exemplars will be shared..

View recording at:

https://zoom.us/rec/share/4i4lk-h5FmMvUesCXDCEyKBEueZmvOBwhnTRnpRYnFTj1dmkyTnMX1TV3WKfJzS9.DZoTIwQKZmQOp6bZ

Passcode: z=Bn4wz#

♥ Speakers



Suzanne Nesmith Associate Dean of Undergraduate Education, Baylor University School of Education



Dana Morris PhD Student/Graduate Assistant, Baylor University Full-time

Mathematics-related beliefs and metacognitive awareness of elementary PSTs

② 12:10pm - 1:00pm, Nov 7

50-minute Research Session

Teacher metacognition and their mathematics-related beliefs have both been shown to have a significant impact on their instructional practice and student learning. This session will discuss PSTs mathematics-related beliefs, their overall metacognitive awareness, and explore potential relationships between these constructs.

View recording at:

https://zoom.us/rec/share/XozCY71TYVV1alz5PBhkQatjXR2aXatO2lWFK0JTHw84tWkMTSKwpl0YbUrt8OM.MC6k5fiUp7qSBfq0

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♥ Speakers



John Weaver Clinical Instructor, Oklahoma State University



Juliana Utley Professor and Morsani Chair in Mathematics/Science Education, Oklahoma State University

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