Emma Eccles Jones
College of Education & Human Services
UtahStateUniversity

Fall 2024
Vol. 14, Issue 1

SCHOOL OF TEACHER EDUCATION AND LEADERSHIP

MATH TALKS

Mathematics Education and Leadership Newsletter

Math Ed Faculty in Logan
Drs. Campbell, Shumway, Frierson, and Vela
(left to right)

Math Ed Faculty meet with Graduate Research and Teaching Assistants for 2024-2025

TOP NEWS OF THE YEAR

NEW MATH ED DOCTORAL COHORT

The Math Ed Faculty are pleased and excited to welcome the new math ed doctoral cohort for this year! We have eight new students joining our group, they come with diverse experiences and backgrounds. We are excited to see what they can bring to the math ed community. Read more on page 2.

MATH ED GRADUATE AWARDED TEAL'S DISSERTATION OF THE YEAR

Dr. KimberLeigh Hadfield, recent Mathematics Education and Leadership Graduate, was awarded TEAL's Dissertation of the Year in April 2024. Read more about her research and this great acheivement on page 5.

MATH ED DOCTORAL GRADUATES

Four graduate students in the Mathematics Education and Leadership concentration proudly graduated with their PhD in Education at the May 2024 Graduation Ceremony. For a full list of graduates, their current position, and dissertation title, visit page 8.

WELCOME TO THE 2024 MATH ED DOCTORAL COHORT

- **Percy Canales**, *Assistant Principal, Syracuse Junior High;* Research interest: Teaching/learning mathematics from the lens of second language acquisition.
- **Kathryn Clark**, *Assistant Director/Assessment Director/Math & Science Specialist GreenWood Charter School;* Research interest: Developmentally appropriate assessment for early childhood mathematics and learning trajectories.
- **Sherish Jabeen**, *Graduate Research/Teaching Assistant, Utah State University;* Research interests: Problem-solving in mathematics at the elementary level, Curriculum design and instructional practices in mathematics.
- **Denice Lingen**, *Dean of General Studies, Ensign College;* Research interest: Effects of online learning on student performance in college mathematics courses in the post-Covid era.
- **Wendy Moss-Dong**, *High School Math Teacher, Salt Lake City, UT;* Research interests: Building thinking classrooms, Assessment Framework.
- **Emmanuel Onyegu**, *Graduate Research/Teaching Assistant, Utah State University;* Research interest: Students' perception on the problems of teaching and learning of mathematics in secondary schools
- **Tyler Powell**, *Middle School Math Teacher, Spring Creek Middle School;* Research interests: Learning styles and increasing understanding in middle/high school mathematics.
- **Jaylee Willis**, *Lecturer, Southern Utah University;* Research interests: Elementary students' conceptual understanding.

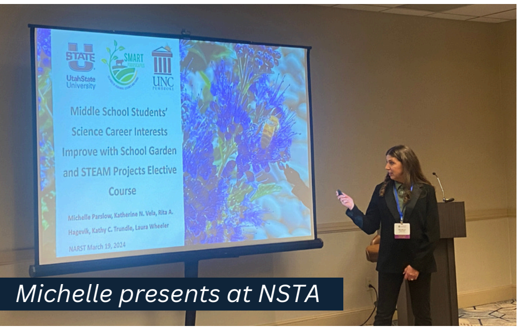
CAMPBELL'S CORNER: CURRENT RESEARCH INSIGHTS

DR. TYE CAMPBELL
ASSISTANT PROFESSOR

Dr. Tye Campbell engaged in several research endeavors over the past academic year. Dr. Campbell and several other professors were awarded an NSF grant to help support mathematics teachers from rural and native areas to become teacher leaders with expertise in mathematical modeling and data science. The project is titled "Community Impact with Teacher Leaders in Data Science and Mathematical Modeling." Dr. Campbell has also conducted several research studies on teachers'/students' affective and social experiences in mathematics. One study, published in Cogent Education, explored how a yearlong intervention supported elementary students to flourish in S.T.E.M. The study is titled "Exploring How Learning by 'Talking and Doing' Supports Flourishing in STEM for Elementary Students." Dr. Campbell looks forward to continuing his research in the coming academic year.

GRADUATE SCHOLARS IN ACTION: SHOWCASING RESEARCH AT ACADEMIC CONFERENCES

Mathematics Education & Leadership graduate students were very productive in the 2023-2024 academic year! **Kimberly Beck** had three publications and two conference presentations. Kimberly used expansive framing to conduct research in the fields of mathematics and computer science education. Her research makes important cross-curricular connections. **Patrick Ocran** was also very active in publishing and presenting at conferences. He is working with Dr. Alyson Lavigne on exciting research in educational leadership. Patrick presented on transforming classroom dynamics and building equitable classrooms. **Michelle Rich** also had a productive year. She has an article in press that examines active learning in undergraduate statistics courses. **Missy Barker** presented at the UCTM conference on using literal equations for STEM success. **Sandra Miles** had two publications and presented at four conferences, most of her research has focused on examining student identity in mathematics and STEM fields. **Michelle Parslow** and **Douglas Weber** shared their research and STEAM lessons related to the USDA Garden Project. Congratulations graduate students!



Michelle presents at NSTA


Doug presents at UCTM


Sandra presents at NCTM

Math Ed Current Students and Alumni at UCTM


Kimberly and Jessica present in Sydney


Missy presents at UCTM

Kimberly presents in Sydney


Patrick's Hands-on Workshop at UCTM

INTEGRATING MATHEMATICS AND COMPUTER SCIENCE: SHUMWAY AND COLLEAGUES STUDY SPATIAL THINKING IN ELEMENTARY CLASSROOMS

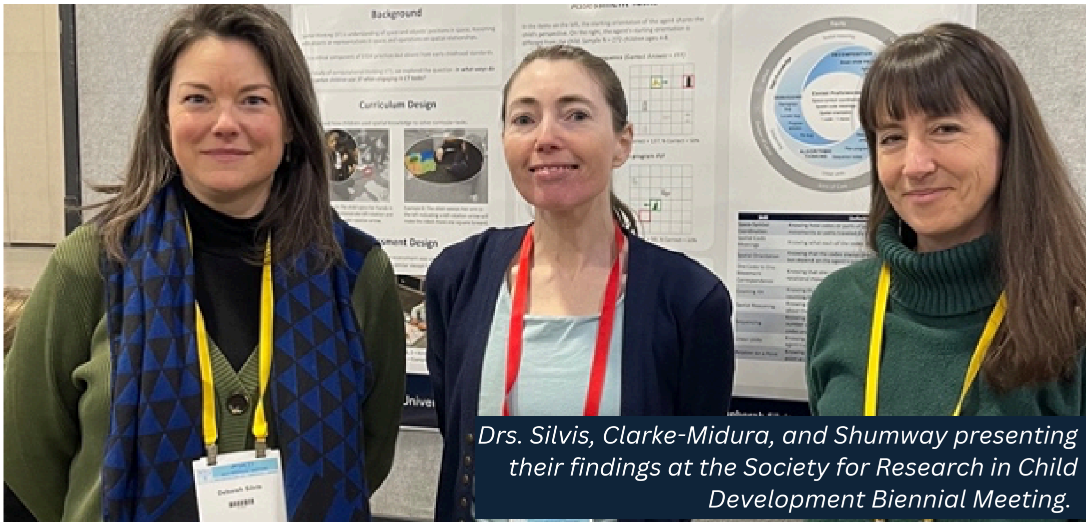
DR. JESSICA SHUMWAY
ASSOCIATE PROFESSOR

Spatial thinking is critical for STEM education. To better understand elementary students' spatial thinking, the Spatial Activities and Robot Coding for Mathematics Research Team (SPARC Mathematics) is conducting research on young children's spatial thinking in the context of learning to code. Drs. Jessica Shumway (Mathematics Education and Leadership in TEAL), Jody Clarke-Midura (Department of Instructional Technology and Learning Sciences), and Deborah Silvis (SUNY Cortland) received an award of $1.5 million from the National Science Foundation to study elementary children's development of mathematical and computational thinking. They are collaborating with a design team of first- and second-grade teachers to develop lessons using computer science tools, such as robot coding toys, to engage elementary students in dynamic, spatially-oriented mathematics learning. The researchers and educators are studying children's thinking using design studies, which are cycles of designing, implementing, analyzing, and improving lessons followed by analyses of children's multimodal interactions with the tools, content, teachers, and peers. Dr. Joey Kozlowski, a graduate of the MEL doctoral program, is a second-grade design team teacher and researcher on the project. Camille Lund, a current MEL doctoral student, is a Graduate Research Assistant for the project. The SPARC Mathematics project is funded by the NSF Discovery Research K-12 program from 2023-2027.

Second-grade students using the Botley Robot with their teacher, Dr. Joey Kozlowski.

Graduate Research Assistants, Camille Lund and Ana Ashineh, and Postdoctoral Researcher, Dr. Boram Lee, with equipment for collecting data in the schools.

MEL doctoral student C. Lund capturing students' spatial and computational thinking with robots.



Drs. Silvis, Clarke-Midura, and Shumway presenting their findings at the Society for Research in Child Development Biennial Meeting.

HONORING THE DISSERTATION OF THE YEAR: A SPOTLIGHT ON ACADEMIC ACHIEVEMENT

CAMICIA PRESENTS HADFIELD WITH THE DISSERTATION OF THE YEAR AWARD AT THE TEAL AWARDS CEREMONY

Dr. KimberLeigh Felix Hadfield was awarded the 2023-2024 TEAL Outstanding Dissertation Award from The School of Teacher Education and Leadership (TEAL). Dr. Hadfield graduated with her Ph.D. in Summer 2023. Her dissertation chair, Dr. Katherine Vela, presented her this distinction at the TEAL awards ceremony in April 2024. Her dissertation, The Impact of Formative Assessment Cycles on Students' Attitudes and Achievement in a Large-Enrollment Undergraduate Introductory Statistics Course helped to provide evidence that pedagogical interventions, like formative assessments in an undergraduate introductory statistics course, can improve student attitudes and achievement. Dr. Hadfield utilized a unique quantitative analysis called regression discontinuity to assess differences in introductory statistics students' achievement who did or did not experience formative assessment cycles. She also used multilevel modeling analysis to discover that students' attitudes were moderated by their subsequent course achievement. She credits her dissertation committee, Drs. Vela, Jessica Shumway, Tyler Barrett, Patricia Moyer-Packenham, and Kady Schnieter for their fantastic direction and support.

Dr. Hadfield is a Senior Lecturer at Utah State University in the Mathematics and Statistics Department, earning the College of Science Teacher of the Year Award in 2020, the department's Faculty Service Award in 2021, and the College Football Playoff Foundation's Extra Mile for Teachers in 2022. Dr. Hadfield spent the last year renovating the curriculum for USU's Stat 1040/1045 courses, which includes concurrent enrollment, and held a Statistics Teaching Workshop in August. She loves inspiring students to think statistically and become critical consumers of information in this data-driven world. She and her partner, Bretton, have been married 30 years and live in North Logan with their two doodles, Maisy and Charlie. Their two sons are their pride and joy and go to their mother for all things math and statistics. Their oldest plays football and is an economics major at University of Alabama in Birmingham and their youngest is a state bowling champion with a PBA Junior title and attends Green Canyon High School.

DR. KIMBERLEIGH HADFIELD,
SENIOR LECTURER
UTAH STATE UNIVERSITY

FRIERSON'S RECENT HIGHLIGHTS

DR. MICHELLE FRIERSON
ASSISTANT PROFESSOR

American Assocition of Educational Research (AERA) 2024

Dr. Frierson had the privilege of presenting at the American Educational Research Association (AERA) 2024 conference in a symposium session titled "Expanding Theory on Teacher Noticing Through Collaborative Inquiry & Co-Design". The symposium session focused on amplifying the voices of students from racial, cultural, and linguistic minority communities who often experience marginalization in mathematics classrooms. Dr. Frierson's paper, "Manifesting Black Joy: Collective Dreaming Toward a More Just Mathematical Future", explored the everyday actions that educators take to support Black joy in mathematics classrooms. This paper examined how a group of mathematics teachers, community educators, and scholars gave their insights on re-envisioning mathematics classrooms that both support and celebrate Black youth through collective futuring and manifestation. This work aimed to highlight the importance of centering Black joy and community perspectives in education which in turn, fosters equitable and inclusive learning environments for all students.

WPI HBCU & SMALL COLLEGE FORUM 2024

Dr. Frierson also presented at the WPI HBCU & Small College Forum 2024: "Metrics Matter: Measuring and Monitoring Strategic Priorities to Ensure Fiscal Strength and Growth. Her presentation, co-authored with Dr. Christopher C. Jett (Georgia State University), was titled "Creating Joy in the Classroom: Empowering Collegiate Communities to Thrive Academically." Dr. Frierson and Dr. Jett explored the transformative potential of joy in educational settings, specifically for supporting mathematics at HBCUs. The presentation offered insights into professional development designed for mathematics professors to lean into culturally relevant pedagogies and asset-based strategies to enhance BIPOC students' learning experiences.

MAA Open Math 2024

Additionally, Dr. Frierson collaborated with Dr. Rebecca Machen (University of Colorado, Boulder) and Dr. Nancy Kress (University of Colorado, Boulder) for the Mathematical Association of America (MAA) Open Math 2024. This collaborative PD session aims to support MAA's focus on revolutionizing online professional development for undergraduate mathematics instructors through Inclusive Active Learning to promote inclusivity in undergraduate mathematics. This session aims to draw insights from DEI discussions in K-12 classrooms that may be applied to higher-ed mathematics classrooms amid the current political uncertainty about DEI initiatives.

Frierson's Connection Class 2024

CATCH-UP CORNER: WHERE ARE THEY NOW?

DR. KATIE ANDERSON-PENCE

DR. KATIE ANDERSON PENCE
ASSOCIATE PROFESSOR
UNIVERSITY OF COLORADO
COLORADO SPRINGS

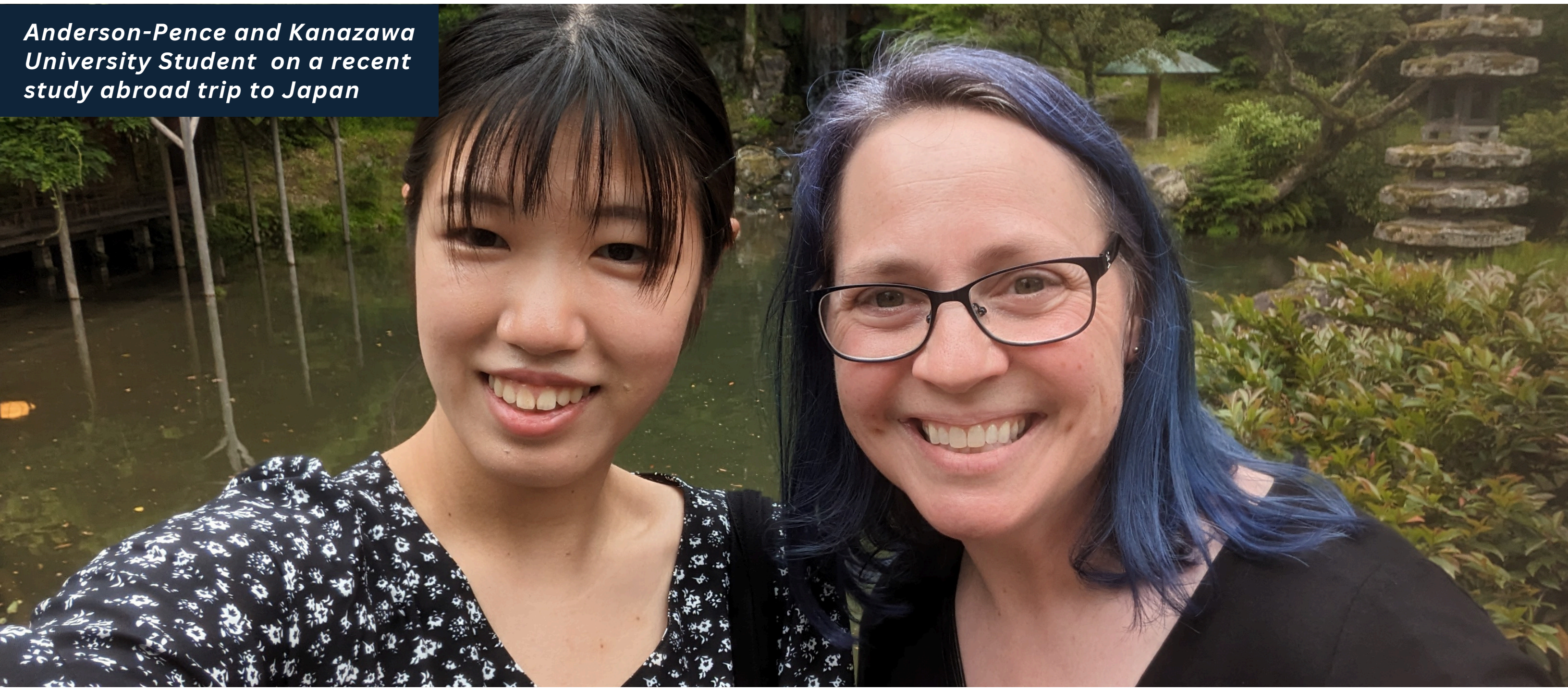
Dr. Katie Anderson-Pence earned a PhD in Curriculum and Instruction with an emphasis in Mathematics Education and Leadership from Utah State University in 2014. Dr. Patricia Moyer-Packenham served as her dissertation chair. In 2013, the Department of Teacher Education and Leadership named Anderson-Pence the Graduate Research Assistant of the Year. Her dissertation examined the impact of different virtual manipulative types on the nature of students' small-group discussions.

Dr. Anderson-Pence (also known as Dr. AP by her students) has just completed 10 years at the University of Colorado Colorado Springs. She is currently an Associate Professor and serves as the Associate Dean for Academic and Faculty Affairs in the College of Education. In this role, she oversees all academic programming, accreditation efforts, and local and international partnerships. She has been pivotal in developing relationships with partner school districts and has led study abroad trips to Japan to learn about the Japanese education system.

Previously to stepping into the role of Associate Dean, Dr. Anderson-Pence served as the elementary education program coordinator and later as the chair of the department of Teaching and Learning. She received the College of Education Outstanding Research Award in 2016 and the College of Education Outstanding Teacher Award in 2019. During her 10 years at UCCS, she has taught numerous undergraduate and graduate-level courses, including elementary math methods, early childhood math methods, and a Harry Potter-themed freshman seminar course.

Dr. Anderson-Pence's current research focuses on teacher education pathways, in particular experiences of teacher apprenticeships in rural communities. She continues to present at conferences (e.g., School Science and Math Association, American Association of Colleges for Teacher Education, and the Northern Rocky Mountain Educational Research Association). She has secure nearly $3.8 million in grant funding for research and student financial support.

Anderson-Pence and Kanazawa University Student on a recent study abroad trip to Japan



CONGRATULATIONS GRADUATES!

- **Dr. Kimberly Beck**, STEM Postdoctoral Teaching Fellow, Weber State University
    - Dissertation: *An Expansive Framing Intervention and its Influence on Nursing Students' Perceptions of Value for Mathematics*
- **Dr. Vicky Lyons**, AP Calculus BC and Statistics Teacher, Lone Peak High School
    - Dissertation: *An Investigation of the Essential Nature of Advanced Placement Students' Psychological Safety and Participation in Mathematics Class Discourse*
- **Dr. Sandra Miles**, Visiting Faculty, Brigham Young University – Idaho, Mathematics Department
    - Dissertation: *How Relational Instruction and Caring Learning Environments Relate to Mathematics Self-Concept: A Multilevel Investigation of the High School Longitudinal Study, 2009 Data*
- **Dr. Jet Warr**, Mathematics Teacher, Tongue River High School
    - Dissertation: *The Coordination of Multiple Mathematical Representations for Algebraic Functions in Secondary Mathematics Textbooks: A Content Analysis*

VELA'S RECENT VENTURES

DR. KATHERINE VELA
ASSISTANT PROFESSOR

Dr. Vela is currently serving as a Co-PI on a research team that received a $6.8 million research grant from the USDA National Institute of Food and Agriculture. She has been working alongside a diverse group of researchers, including Dr. Kathy Cabe Trundle and Aurora Villla (USU-TEAL), Drs. Rita Hagevik and Kaitlin Campbell (University of North Carolina-Pembroke), Dr. Lawrence Krissek (The Ohio State University), and Dr. William Boone (Miami University), Doug Weber, and Michelle Parslow. This education research group is part of a larger interdisciplinary team that involves faculty from across Utah State University and around the globe.

The project supports several school partnerships in the Logan and Price areas, including Edith Bowen Lab School, Wellington Elementary, Wahlquist Junior High, Pinnacle Academy, and Carbon High School. The Elementary and Junior High Schools have successfully installed their gardens, which included 6 raised garden beds, bee homes, a greenhouse, weather station, and a garden shed. Carbon High School will be constructing their garden this year. The education research team have worked with the teachers to develop STEAM garden-based curricula that can be implemented to engage students in nature. This past summer the education research team, alongside their teacher partners, hosted an Elementary Bee Summer Camp to pilot the curricula and engage students in STEAM content and improve students' nature identity and knowledge of bees. The camps were a huge success and the team looks forward to hosting a Secondary Bee Summer Camp next summer!

ABOUT US

The Mathematics Education and Leadership Programs in the School of Teacher Education and Leadership in the Emma Eccles Jones College of Education and Human Services provide students with a variety of advanced study options in mathematics education at the graduate level. Students can select the Mathematics Education and Leadership Concentration in the PhD program, the Elementary Mathematics Endorsement emphasis in the Master of Education Degree in Elementary Education, professional development credit in the online Elementary Mathematics Teachers Academy, or the Secondary Mathematics Emphasis in the Master of Education Degree in Secondary Education. The Mathematics Education and Leadership Programs at Utah State University provide students with opportunities to focus on enhancing their mathematics education expertise and develop leadership skills for positions at all levels of mathematics teaching, learning, supervision, and research. Contact the director today to begin your graduate work in Mathematics Education and Leadership at Utah State University!

Dr. Jessica Shumway, PhD
Mathematics Education and Leadership Program Director
jessica.shumway@usu.edu · (435) 797-2501

Interested in writing a piece for the newsletter or have an idea for a story? Reach out to Katherine Vela - katherine.vela@usu.edu