Christopher Engledowl

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EDUCATION

Ph.D., Mathematics Education, University of Missouri, Aug 2017
> Dissertation Advisor: James E. Tarr
> Dissertation Title: *Secondary Mathematics Teachers' Informal Inferential Reasoning: The Role of Knowledge Structures for Measures of Center, Spread and Shape*

M.A., Teaching Secondary Education—Mathematics, University of Arkansas, May 2010

B.A., Mathematics, University of Arkansas, June 2009

A.S., Northwest Arkansas Community College, June 2006

PROFESSIONAL EXPERIENCE

Research Scientist, Coordinator Math Content Development & Implementation

> Lastinger Center for Learning, University of Florida, April 2023–Present

> I lead research and evaluation efforts for the Math Matrix—an online professional learning system—and support research efforts for New Worlds Reading Initiative and the Literacy Microcredential professional learning system. I am also leading a mixed methods research project for the statewide Listening Tour that involves surveys and focus group interviews of multiple stakeholders across the state about their perceptions of the benefits and challenges of mathematics education in K–12 schools in Florida. I collaborate with content writers, graphic artists, videographers, designers, communications specialists, subject matter experts, and data scientists across the center to help grow the Flamingo Learning platform's user base and evaluate the efficacy of existing programs.

Senior Quantitative User Experience Researcher

> Meta, Facebook Search, July 2022–Nov 2022

> I led international projects around Search Jobs to Be Done and Search Pain Points, collaborating with project managers, content designers, software engineers, data engineers, data scientists and product operations specialists, to craft solutions with and through user experience research to positively impact product and move top level business priority metrics. I drew on a rich set of quantitative analysis methods to support this work, including the use of post-stratification weighting to control for inherent and known survey bias to obtain clearer understandings of users' experiences to support the product teams. I also worked to improve systems processes by identifying gaps in quality, bringing people together to collaborate on solutions including multiple levels of management, and sharing knowledge with others more formally to develop larger scale understanding of the problems with suggested solutions.

Assistant Professor

New Mexico State University, Department of Curriculum & Instruction, Las Cruces, NM, August 2017–July 2022

> Affiliate Faculty of the *[Data Science and Application Center](#)* (2021–2022)
>
> Faculty Lead of the *Center for Research and Improvement of STEM Teaching and Learning (CRISTL, name pending)* (Spring–Summer 2022)

Graduate Research Assistant

> University of Missouri, Department of Learning, Teaching & Curriculum, Columbia, MO, August 2013–July 2017
>
> *Responsibilities:* I supported multiple internally and externally funded research projects. I collected qualitative and quantitative forms of data, coded and analyzed transcript data, managed and analyzed quantitative data sets using R (ANOVA, multiple regression, latent class analysis), collaborated with teams of researchers from multiple departments and institutions to ensure that research plans fit within the larger context of the projects I worked under, and I collaborated to present and publish findings in top tier venues for relevant stakeholder groups.

High School Mathematics Teacher

> Fayetteville High School, Fayetteville, AR, August 2010–June 2013.
>
> *Responsibilities:* Teaching Advanced Placement Statistics (2011–2012), Advanced Algebra with Trigonometry (2010-2011; 2012-2013), Algebra II (2012–2013), Algebraic Connections (2010–2012).

Title I Paraprofessional

> Elmdale Elementary School, Springdale, AR, August 2005–June 2006.
>
> *Responsibilities:* Collaborate with K-5 grade level teachers and Title I and ESL teachers to construct and implement reading and mathematics lessons that would aid students receiving Title I or ESL services. I also worked daily with small groups of 4–5 students at level 1 language proficiency in grades 3–5 on both reading and mathematics content. The school served mostly low-income, minority students.

GRANT PROPOSALS WRITTEN

Oct 2020   *Math Snacks and Data Jam: Blending Two Successful Interventions into an Innovative Approach to Build Statistical Literacy*. National Science Foundation (Competitive, not funded), DRK12, $3,000,000. New Mexico State University, Las Cruces, NM. **Principal Investigator: Christopher Engledowl**. Co-Principal Investigators: Stephanie Bestelmeyer, Barbara Chamberlin, Pamela Martinez.

Aug 2020   *Building Experts into Supported Teachers–New Mexico (BEST–NM)*. National Science Foundation (Competitive, not funded, #2050482), NOYCE Capacity Building, $124,999. New Mexico State University, Las Cruces, NM. Principal Investigator: David Rutledge. Co-Principal Investigators: Michèle Shuster, **Christopher Engledowl**, Tracey Gorham Blanco, German A. Moreno.

Aug 2019   *Building Experts into Supported Teachers–New Mexico (BEST–NM)*. National Science Foundation (not funded), NOYCE Capacity Building, $124,890. New Mexico State University, Las Cruces, NM. Principal Investigator: David Rutledge. Co-Principal Investigators: Michèle Shuster, **Christopher Engledowl**.

Nov 2019   *Math Snacks and Data Jam: Blending Two Successful Interventions into an Innovative Approach to Build Statistical Literacy*. National Science Foundation (Competitive, not funded), DRK12, $2,999,997. New Mexico State University, Las Cruces, NM. Principal Investigator: **Christopher Engledowl**. Co-Principal Investigators: Stephanie Bestelmeyer, Barbara Chamberlin.

RESEARCH PROJECTS
    Externally Funded Projects

2023–Present   *Mathematics Professional Development Statewide Pilot*. Florida Department of Education (HF 1942, SF 1351) [Approved; Pending]. $500,000, UF Lastinger Center for Learning, Gainesville, FL. Principal Investigator: Zandra de Araujo. Co-PI: Phil Poekert.

2023–Present   *Building Awareness and Research Around Math in Florida*. Bill & Melinda Gates Foundation [Approved; Pending]. $450,000, UF Lastinger Center for Learning, Gainesville, FL.

2023–Present   *Math Exploration and Summit Series*. Helios Education Foundation. $300,000, UF Lastinger Center for Learning, Gainesville, FL. Principal Investigator: Zandra de Araujo. Co-PI: Phil Poekert.
                Responsibilities: **Lead Research Scientist**. I lead all research efforts for the project, including survey development, dissemination, and analysis, as well as focus group interview protocol development and analysis. I also lead dissemination efforts of the results to multiple stakeholder audiences, including, state and local policy makers, K-12 educators and administrators, community and business leaders, and parents of K-12 students.

2020–2022   *Impact on Underrepresented Minorities: A Scalable Independent Evaluation Framework for the Space Grant Program*. NASA NSPIRES (#80NSSC20M0265), $174,358. New Mexico State University, Las Cruces, NM. Principal Investigator: Paulo Oemig.
                Responsibilities: **Statistical Consultant**. I supported methodological decisions and analysis plans as they aligned with project goals and aims.

2017–2021   *Math Snacks Early Algebra: Using Games and Inquiry to Help Students Transition from Number to Variable*. National Science Foundation (#1503507), DRK-12, $2,999,995. New Mexico State University, Las Cruces, NM. Principal Investigator: Wanda Bulger-Tamez. **Co-Principal Investigators**: Theodore Stanford, Barbara Chamberlin, **Christopher Engledowl (2019–current)**.

2021–2021   *Pathways to Careers Curriculum Implementation*. New Mexico PED College and Career Readiness Bureau, $225,691. Mathematically Connected Communities, New Mexico State University, Las Cruces, NM. Principal Investigator: Wanda Bulger-Tamez, **Co-Principal Investigator: Christopher Engledowl**, Project Specialist: Patricia Carden, Web/Materials Designer: Terri Sainz. Professional Learning Support Consultant: Tanya Rivers.

2016–2022   *Studying Teacher Expertise & Assignment in Mathematics (STEAM)*. National Science Foundation (#1414438), DRK-12, $2,189,540. University of Missouri, Columbia, MO. Principal Investigator: Barbara Reys (2014-–2015), Corey Webel

(2016–2018). Co-Principal Investigators: Barbara Reys (2016–2018), James Tarr, Nianbo Dong.
Responsibilities: Carrying out classroom observations in multiple elementary school classrooms using the project's observational protocol and quantitative data analysis. Observations included recording a written lesson tape during the lesson, recording some contextual information, applying codes based on 8 criteria regarding the learning environment, and comparing and resolving mismatched codes afterward with a partner who also observed the lesson. Quantitative data analysis includes using data collected from multiple surveys, assessments of mathematical knowledge for teaching, as well as from classroom observations.

2015–2018   *Centers for Learning and Teaching: Research to Identify Changes in Mathematics Education Doctoral Preparation and the Production of New Doctorates*. National Science Foundation (Award #1434442), DRK-12. University of Missouri, Columbia, MO. Principal Investigator: Robert Reys. Co-Principal Investigator: Barbara Reys.
Responsibilities: Managing data, analyzing qualitative and quantitative data across multiple data sets, aiding in writing conference proposals and manuscripts for publication.

2013–2017   *Understanding and Implementing the CCSSM Practices*. A project funded by the University of Missouri System Research Board and the University of Missouri Research Council. Principal Investigator: Samuel Otten.
Responsibilities: Field observations (video, audio, written), analyzing video and audio observation data, helping write conference proposals and manuscripts.

Fall 2014   *Tomorrow's Teachers with Dual Degrees in Mathematics and Mathematics Education (TDM)2 (Noyce Teacher Scholarships)*. National Science Foundation. University of Missouri, Columbia, MO. Principal Investigator: James Tarr. Co-Principal Investigators: Carmen Chicone and Barbara Reys.
Responsibilities: Recruiting students from all sections of Calculus II and attending the Midwest Regional Noyce Connections Conference in Omaha, NE.

Internally Funded Projects

2022   *Evaluating STEM Academic Success in Gadsden Independent School District.* Supported by the NMSU Office of the Chancellor, NMSU Office of the Vice President for Research, the NMSU Graduate School, and the College of Health, Education, and Social Transformation. **Principal Investigator: Christopher Engledowl.**

Research Projects Without Funding

2018–2022   *Teacher Planning for and Implementation of Student Engagement in the Statistical Problem Solving Process*. This design-based research project is a collaboration with an 8th grade mathematics teacher on the teaching of statistics content. Focus is on the planning for engaging students in the statistical problem solving process. Data collection is on-going and is in the form of teacher interviews and classroom observations (field notes and observation protocol).

2018–2022   *Middle School Mathematics Teachers' Engagement in the Statistical Problem Solving Process*. This research project is being conducted in collaboration with

Mathematically Connected Communities (MC^2). Middle school mathematics teachers engaged in the statistical problem solving process, as described in the *GAISE* report, within the context of a 3-day professional learning summer session. Video, audio, and written forms of data were collected to examine engagement. Data analysis and dissemination of results are on-going.

COLLEGE TEACHING EXPERIENCE

EDUC 402—Data Literacy and Assessment

New Mexico State University, Las Cruces, NM, Spring 2018/2019, Spring 2021/2022 (online, synchronous)
Content Focus: Undergraduate course required for all secondary education majors that centers on formative and summative assessment practices at the classroom level, as well as interpretation of state, national, and international standardized assessment results.

EDUC 519—Research in Curriculum and Pedagogy (QM Certified)

New Mexico State University, Las Cruces, NM, Summer 2018 (online, asynchronous), Fall 2018 (F2F), Fall 2019/2020 (online, asynchronous), Spring 2021 (online, asynchronous)
Content Focus: Master's course required for all Master's level degree programs in Curriculum and Instruction. Content centers on the structure of research articles and the process of conducting research. Learning goals include locating and evaluating the quality of published research, summarizing published research, and constructing literature reviews that reveal gaps in the literature and lead to a plausible research question.

EDUC 516—Curriculum and Pedagogy

New Mexico State University, Las Cruces, NM, Fall 2020 (online, asynchronous)
Content Focus: Master's course required for all Master's level degree programs in Curriculum and Instruction. Content centers on a critical analysis of historical development of curriculum, standards, and assessment in the US and a focus on a multicultural education perspective on teaching and learning for the production of a socially just and equitable school, district, community, and professional system.

EDUC 607—Current Research in Educational Practice

New Mexico State University, Las Cruces, NM, Fall 2021 (online, asynchronous)
Content Focus: Doctoral course required for all students in the Curriculum and Instruction Online PhD program. Content centers on current research and practice in education, both broadly and within students' own particular disciplines and interest areas.

EDUC 613—Evaluation of Quantitative Research in Education

New Mexico State University, Las Cruces, NM, Fall 2017, Fall 2018/2019, Fall 2021 (online, synchronous)
Content Focus: Doctoral course focused on 1) being a critical consumer of education research employing quantitative methods and 2) developing understanding of introductory formal statistics topics (e.g., p-value, confidence interval, t-test).

CEPY 636—Advanced Statistics

New Mexico State University, Las Cruces, NM, Summer 2019 (hybrid)

Content Focus: Doctoral course focused on application of *t*-test, ANOVA, ANCOVA, correlation, and simple linear regression within both counseling and educational psychology as well as broader education contexts. SPSS is the main software used.

CEPY 637—Multivariate Statistics

New Mexico State University, Las Cruces, NM, Spring 2018/2019/2020, Spring 2021/2022 (online, synchronous)
Content Focus: Doctoral course focused on application of multiple linear regression, MANOVA, MANCOVA, and factor analysis within both counseling and educational psychology as well as broader education contexts. SPSS is the main software used.

LTC 4370—Teaching and Modeling Middle School Mathematics

University of Missouri, Columbia, MO, Fall 2015.
Content Focus: Geometry, measurement, probability, statistics.
Responsibilities: Instructor of Record. I was responsible for all aspects of the course including conceptualizing and grading assignments.

LTC 4581—Teaching Mathematics in Secondary Schools: Algebra

University of Missouri, Columbia, MO, Spring 2015, Spring 2016.
Content Focus: Algebra and Technology (iPad Apps, TI-Nspire/Navigator, Google Drive, Geogebra, etc.)
Responsibilities: Instructor of Record. I was responsible for all aspects of the course including conceptualizing and grading all assignments. In the Spring of 2016, middle school preservice teachers were included in the course, which required some adaptations and differentiation of assignments.

TEACHING LICENSURE

Certified Teacher of Mathematics (7–12), Arkansas, 2010–2016

HONORS AND AWARDS

2022	Acceptance to attend the National Science Foundation-funded Developing and Evaluating Assessments of Problem Solving (DEAP) conference, Feb 12–13, 2022, Henderson, NV.
2020	Acceptance to attend the National Science Foundation-funded *Validity Evidence for Measurement in Mathematics Education (V-M²ED)* conference, Feb 20–21, 2020, Las Vegas, NV.
2018–19	Distinguished Member of the NMSU Teaching Academy
2018	STaR (Service, Teaching, and Research) Institute Fellow, Association of Mathematics Teacher Educators
2015	College of Education Graduate Student Scholar of the Year: Learning, Teaching, and Curriculum Department Nominee (each of the five departments submitted one nominee to the College of Education for final selection)

Graduate Research Assistantship, University of Missouri, *Centers for Learning and Teaching: Research to Identify Changes in Mathematics Education Doctoral Preparation and the Production of New Doctorates*., 2015–2016

Graduate Research Assistantship, University of Missouri, *Understanding and Implementing the CCSSM Practices*, 2013–2015.

Mathematics Education Fellowship, University of Missouri, $5000, 2013-2017.

REFEREED PUBLICATIONS
*Denotes Graduate Student

Byun, S., Weiland, T., Cannon, S. O., Fernandes, A., Nti-Asante, E., Peterson, F., Smucker, K., & **Engledowl, C.** (2023). Teaching and learning with data investigation. [Working Group Report], *Proceedings of the 45th annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education*.

Weiland, T., **Engledowl, C.** (2022). Transforming curriculum and building capacity in K–12 data science education. *Harvard Data Science Review, 4*(4). https://hdsr.mitpress.mit.edu/pub/p9iemahk/release/1?readingCollection=7e5ac077.

Byun, S., **Engledowl, C.**, Cannon, S. & Weiland, T. (2022). Teaching and Learning with Data Investigation. In A. Lischka, E. B. Dyer, R. S. Jones, J. N. Lovett, J. Strayer, & S. Drown (Eds.), *Proceedings for the 44th annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (pp. 2091–2093). Nashville, TN.

Weiland, T. & **Engledowl, C.** (2022). Future directions for statistics education. In A. Lischka, E. B. Dyer, R. S. Jones, J. N. Lovett, J. Strayer, & S. Drown (Eds.), *Proceedings for the 44th annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (pp. 2085–2090). Nashville, TN.

Engledowl, C. & Stanford, T. (2022). Elementary students' emergent use of parentheses when writing expressions in a sandbox style learning game. In A. Lischka, E. B. Dyer, R. S. Jones, J. N. Lovett, J. Strayer, & S. Drown (Eds.), *Proceedings for the 44th annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (pp. 1965–1969). Nashville, TN.

Engledowl, C., Al-younes, M.*, Chamberlin, B., Stanford, T. (2021). Learning acquired from a computer game-based early algebra intervention. *School Science and Mathematics, 121*, 495-508. DOI: 10.1111/ssm.12500.

Engledowl, C., Al-younes, M.*, Degardin, G.*, Alzaid, A.* (2021). Impacts of a computer game-based early algebra intervention. In D. Olanoff, K. Johnson, S. M. Spitzer (Eds.), *Proceedings for the 43rd annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (pp. 1366–1367). Philadelphia, PA.

Weiland, T., **Engledowl, C.** (2021). Statistics education: New connections and future directions / Educación estadística: Nuevas conexiones y futuras direcciones. In D. Olanoff, K. Johnson, S. M. Spitzer (Eds.), *Proceedings for the 43rd annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (pp. 1929–1931). Philadelphia, PA.

Engledowl, C., Weiland, T. (2021). Data (mis)representation and COVID-19: Leveraging misleading data visualizations for developing statistical literacy across grades 6–16. *Journal of Statistics and Data Science Education*. DOI: https://doi.org/10.1080/26939169.2021.1915215. Available at https://www.tandfonline.com/doi/full/10.1080/26939169.2021.1915215

Engledowl, C., Webel, C., Yeo, S.* (2021). Profiles of elementary teachers' use of curriculum materials for teaching mathematics. *International Electronic Journal of Mathematics Education*, *16*(2), 1–16. Available at https://www.iejme.com/article/profiles-of-elementary-teachers-use-of-mathematics-curriculum-materials-and-the-influence-of-teacher-9702

Alzaid, A.*, **Engledowl, C.** (2021). Benefits and challenges of game-embedded telemetry data to examine student learning. In *Proceedings for the 2021 Annual Meeting of the Society for Information Technology & Teacher Education (SITE).*

Otten, S., Wambua, M.*, Bleiler-Baxter, S., **Engledowl, C**. (2020). Sharing authority in proof but not all at once. *The Oregon Mathematics Teacher*, *November/December*, 26–31.

Engledowl, C., Rutledge, D. (2020). National policies: Catalyst for teacher preparation program enrollment and completion decline? *Mid-Western Educational Researcher*, 33(3), 255–264. Available at https://www.mwera.org/MWER/

Engledowl, C. (2020, March 20). Adapting statistics instruction for an online environment in the wake of COVID-19. *StatTLC: Statistics Teaching and Learning Corner*. Available at https://stattlc.com/2020/03/20/adapting-statistics-instruction-for-an-online-environment-in-the-wake-of-covid-19/

Engledowl, C., Tarr, J. (2020). Secondary teachers' knowledge structures for center, spread & shape of distributions supporting their statistical reasoning. *International Journal of Education in Mathematics, Science and Technology, 8*(2), 146–167. Available at https://ijemst.net/index.php/ijemst/article/view/810

Engledowl, C. (2020). Constructing and validating an early algebra assessment. In J. Cribbs and H. Marchionda (Eds.), Proceedings for the Annual Meeting of the Research Council on Mathematics Learning (pp. 51–58). Las Vegas, NV. Available at https://www.rcml-math.org/assets/Proceedings/RCML%202020%20Proceedings%202-19-20.pdf#page=57

Shih, J., Reys, R., Reys, B., & **Engledowl, C.** (2020). Examining the career paths of doctorates in mathematics education working in institutions of higher education. *Investigations in Mathematics Learning*, *12*(1), 1–9. https://doi.org/10.1080/19477503.2018.1514954

Weiland, T., Mojica, G., **Engledowl C.**, Jones, R. (2019). Statistics Education: (Re)framing past work for taking a holistic approach in the future. In Otten, S., Candela, A. G., de Araujo, Z., Haines, C., & Munter, C. (Eds.), Proceedings for the 41st annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education (pp. 1954–1966). St. Louis, MO.

Engledowl, C., Gorham Blanco, T., Al-Younes, M*. (2019). Middle level teachers' engagement in the statistical problem-solving process. In Otten, S., Candela, A. G., de Araujo, Z., Haines, C., & Munter, C. (Eds.), Proceedings for the 41st annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education (p. 615). St. Louis, MO.

Engledowl, C., Gorham Blanco, T. (2019, September). Using LOCUS released items with practicing teachers. *Statistics Teacher*. Available at https://www.statisticsteacher.org/2019/09/19/using-locus-released-items/

Engledowl, C. (2019). Heat maps: A case for inclusion in secondary statistics instruction. *Teaching Statistics, 41*(2), 42–46. doi: 10.1111/test.12177

Shih, J., Reys, R. E., Reys, B. J., & **Engledowl, C.** (2019). A profile of mathematics education doctoral graduates' background and preparation in the United States. *Investigations in Mathematics Learning, 11*(1), 16–28. https://doi.org/10.1080/19477503.2017.1375357

Engledowl, C., Tarr, J. (2018). Middle and secondary teachers' informal inferential reasoning. In T.E. Hodges, G.J. Roy, & A.M. Tyminski (Eds.), *Proceedings for the 40th annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (pp. 840–847). Greenville, SC.

Engledowl, C., Tarr, J. (2018). Middle and secondary teachers' PCK within IIR contexts. In T.E. Hodges, G.J. Roy, & A.M. Tyminski (Eds.), *Proceedings for the 40th annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (p. 881). Greenville, SC.

Reys, R. E., Shih, J., & **Engledowl, C.** (2018). Issues of validity in reporting the number of doctorates in mathematics education. *Investigations in Mathematics Learning, 10*(1), 1–8. https://doi.org/http://dx.doi.org/10.1080/19477503.2017.1375356

Otten, S., Bleiler-Baxter, S. K., & **Engledowl, C.** (2017). Authority and whole-class proving: The case of Ms. Finley. *Journal of Mathematical Behavior, 46,* 112–127.

Engledowl, C. (2016). Characteristics of secondary statistics teachers. In M.B. Wood, E. E. Turner, M. Civil, & J. A. Eli (Eds.), *Proceedings of the 38th annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education*, (p. 1008). Tuscon, AZ: The University of Arizona.

Shih, J., Reys, R., **Engledowl, C.** (2016). Profile of research preparation of doctorates in mathematics education. *Far East Journal of Mathematical Education*, *16*(2), 135–148.

Engledowl, C., Otten, S., Spain, & V. (2015). The discourse of attending to precision in secondary classrooms. In T. G. Bartell, K. N. Bieda, R. T., Bradfield, & H. Dominguez (Eds.), *Proceedings of the 37th annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (pp. 1030-1037). East Lansing, MI: Michigan State University.

Engledowl, C., Otten, S. (2015). Attending to precision: A gateway to other practices. *Mathematics in Michigan*, *48*(2), 18-22.

Otten, S., **Engledowl, C.** (2015). Attending to precision and revisiting definitions. *Mathematics in Michigan*, *48*(2), 10-13.

Otten, S., **Engledowl, C.**, Spain, V. (2015). Attending to precision in secondary classrooms: Univocal and dialogic discourse. *ZDM – The International Journal on Mathematics Education, 47*, 1285-1289.

Otten, S., **Engledowl, C.**, & Spain, V. (2014). Teachers' developing talk about the mathematical practice of attending to precision. In S. Oesterle, C. Nicol, P. Liljedahl & D. Allan (Eds.), Proceedings of the 38th conference of the International Group for the Psychology of Mathematics Education and the 36th conference of the North American Chapter (Vol. 6, pp. 191). Vancouver, BC: PME.

Otten, S., **Engledowl, C.**, & Spain, V. (2014). Tasks and talk moves that promote student reasoning. *Mathematics in Michigan*, *47*(1), 20-24.

REFEREED BOOK CHAPTERS

Weiland, T., **Engledowl, C.**, Cannon, S. O. (In Press). Preparing teachers of statistics: A critical read of standards, review of past research, and future directions. To be included in B. Benken (Ed.), the AMTE Professional Book Series, Volume 5, *Reflection on Past, Present and Future: Paving the Way for the Future of Mathematics Teacher Education*. IAP.

Engledowl, C. (2023). Math Snacks: A history of cultivating digital game-based learning environments. In C. Martin, B. Miller, & D. Polly (Eds.), *Technology Integration and Transformation in STEM Classrooms*. IGI Global. DOI: 10.4018/978-1-6684-5920-1.ch013

NON-REFEREED PUBLICATIONS

Whitaker, D., Bolch, C., Harrell-Williams, L., Casey, S., Huggins-Manley, C., **Engledowl, C.**, Tjoe, H. (2021). The search for validity evidence for instruments in statistics education: Preliminary findings. In R. Helenius, E. Falck (Eds.), *Statistics Education in the Era of Data Science, Proceedings of the International Association for Statistics Education (IASE) 2021 Satellite Conference*, Aug-Sept 2021, Online conference. https://iase-web.org/documents/papers/sat2021/IASE2021%20Satellite%20170_WHITAKER.pdf?1649974217

SCHOLARSHIP UNDER REVIEW

Engledowl, C. (revise and resubmit). Impacts and differential effects of an early algebra digital game-based learning intervention on elementary student knowledge construction. *Mathematical Thinking and Learning*.

Cezarotto, M., Martinez, P., Torres Castillo, R. Stanford, T., **Engledowl, C.**, Degardin, G. Chamberlin, G. (under review). Open-ended mathematics learning: Implications from the design of a sandbox game. *International Journal of Game-Based Learning*.

INVITED PRESENTATIONS

Engledowl, C. (2023, April 28). A Mixed Method Approach to Validity to Help Build Trust. Presentation to the *Quant Qual Bridge Community: Connecting Qualitative, Quantitative and Hybrid Approaches to Data*.

Engledowl, C., Webel, C., & Yeo, S. (2021, Dec 16). Using Latent Class Analysis to Examine Profiles of Teachers' Use of Curriculum Materials. STEAM Project Conference. December 15–16, Branson, MO.

Conner, K., **Engledowl, C.**, I, J., DeLeeuw, W., Smith, E. (2020, Oct 2). Panel Member. University of Missouri Mathematics Education Friday Seminar: Assistant Faculty Work Experiences and Job Market Expectations. University of Missouri Mathematics Education Department.

Brown, S., Cahill, E., **Engledowl, C.**, Boren, R. & Lehnert-LeHouillier H. (May 5, 2020). Closing session panel discussion with experienced College of Education Principal Investigators (Webinar). Education Research & Budgeting Office (ERB) Spring Program 2020: Research Essentials for Faculty & Graduate Students. New Mexico State University College of Education.

Chamberlin, B., **Engledowl, C.**, & Torres Castillo, R.* (2020). Supporting student play while they are away. Presented at 21st Century Math: Engaging Online Students in Multi-

Sensory Learning, A Free Virtual Unconference for Math Teachers. MidSchoolMath. Video archive available at https://youtu.be/198y5A7hF0w.

PRESENTATIONS

Byun, S., Weiland, T., Cannon, S. O., Fernandes, A., Nti-Asante, E., Peterson, F., Smucker, K., Adamoah, K. Y., & **Engledowl, C.** (2023). Teaching and learning with data investigation: Toward a socially and environmentally just world. [Working Group], Proceedings of the 45th annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education.

Bainter, T., & **Engledowl, C.** (2023). Reconceptualizing professional development in response to these ever-changing contexts. Presented at the Florida Association of Mathematics Teacher Educators 2023 Virtual Symposium, Empowering Mathematical Minds: Promoting Equitable Outcomes and Innovation in Mathematics Teacher Education on November 3, 2023.

Engledowl, C. (2023). Purposefully Integrated Mixed Methods: Using a Validity Framework to Drive Scalable and Reliable Long-Term Research. Presented at Quant UX Conference 2023 on June 15, 2023.

Byun, S., **Engledowl, C.**, Cannon, S., Weiland, T. (2022). Teaching and Learning with Data Investigation. Working group facilitated at the 44th annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education. Nashville, TN.

Engledowl, C., Stanford, T. (2022). Elementary students' emergent use of parentheses when writing expressions in a sandbox style learning game. Paper presented at 44th annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education. Nashville, TN.

Webel, C., Tarr, J., Yeo, S., Shim, H., Austin, C. Conner, K., Sheffel, C., Nguyen, P., Stewart, M., **Engledowl, C.**, Reys, B. (2022). The work of elementary mathematics specialists: Findings from the STEAM project. Paper presented at the 2022 Annual Meeting of the American Education Research Association Conference.

Bostic, J., Carney, M., Casey, S., **Engledowl, C.**, Folger, T., Gallagher, M. Howell, H., Smith, W., Tjoe, H., & Wilhelm, A. (2022). Choose your instruments wisely: Supporting mathematics teacher educators' research and practice. Symposium presented at the 2022 Association of Mathematics Teacher Educators Conference. Henderson, NV.

Engledowl, C. (2021, November 5). Data science and statistics education: An emergent field brings new possibilities. Presentation at the Data Science Faculty Symposium hosted by the Data Science and Application Center (DaSA) as part of the 2021 New Mexico State University Research and Creativity Week. Las Cruces, NM.

Engledowl, C., Al-younes, M.*, Degardin, G.*, Alzaid, A.* (2021). Impacts of a computer game-based early algebra intervention. Paper presented at the 43rd annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education. Philadelphia, PA.

Weiland, T., **Engledowl, C.** (2021). Statistics education: New connections and future directions / Educación estadística: Nuevas conexiones y futuras direcciones. Paper presented at the 43rd annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education. Philadelphia, PA.

Harrell-Williams, L., Huggins-Manley, C., Tjoe, H, Casey, S., **Engledowl, C.**, Whitaker, D., Bolch, C. (2021). Expanding opportunities: Facilitating discussions to improve measurement practices in statistics education research. Paper presented at the 2021 United States Conference on Teaching Statistics (USCOTS).

Whitaker, D., Bolch, C., Harrell-Williams, L., Casey, S., Huggins-Manley, C., **Engledowl, C.**, Tjoe, H. (2021). The search for validity evidence for instruments in statistics education: Preliminary findings. Paper presented at the International Association for Statistics Education (IASE) 2021 Satellite Conference.

Alzaid, A.*, **Engledowl, C.** (2021). Benefits and challenges of game-embedded telemetry data to examine student learning. Paper presented at the 2021 Annual Meeting of the Society for Information Technology & Teacher Education (SITE). Presentation video available at https://youtu.be/bwRroLRN0F8

Engledowl, C., Al-younes, M.*, Chamberlin, B. (2021). Changes in upper elementary students' early algebra knowledge sophistication: Results from a computer game-based intervention. Paper presented at the 2021 Annual Meeting of the American Education Research Association Conference.

Engledowl, C. (2020). Constructing and Validating an Early Algebra assessment. Paper presented at the 2020 Annual Conference of the Research Council on Mathematics Learning. Las Vegas, Nevada.

Engledowl, C., Gorham Blanco, T., Al-Younes, M*. (2019). Middle level teachers' engagement in the statistical problem-solving process. Paper to be presented at the 41st annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education. St. Louis, MO.

Engledowl, C., Tarr, J. (2018). Middle and secondary teachers' informal inferential reasoning. Paper presented at the 40th annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education. Greenville, SC.

Engledowl, C., Tarr, J. (2018). Middle and secondary teachers' PCK within IIR contexts. Paper presented at the 40th annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education. Greenville, SC.

Webel, C., Tarr, J., Austin, C., Yeo, S., Sheffel, C., Dong, N., Reys, B., **Engledowl, C.** (2018). Elementary mathematics specialists and their peers: Comparing beliefs, knowledge, and instructional practices. Proposal for paper to be presented at the 2018 Annual Meeting of the American Education Research Association.

Webel, C., **Engledowl, C.**, Yeo, S. (2018). Patterns in elementary teachers' selection, use, and perceptions of materials for teaching mathematics. Paper be presented at the annual meeting of the Association of Mathematics Teacher Educators, Houston, TX.

Shih, J., Reys, R., Reys, B., **Engledowl, C.** (2018). Messages for doctoral programs in mathematics education based on feedback from over 500 doctoral graduates. Paper to be presented at the annual meeting of the Association of Mathematics Teacher Educators, Houston, TX.

Engledowl, C., Reys, R. E., Shih, J. (2017). Implications for the preparation of mathematics education doctoral students from a recent research study. Paper presented at the annual meeting of the Association of Mathematics Teacher Educators, Orlando, FL.

Engledowl, C. (2016). Characteristics of secondary statistics teachers. Poster presented at the 38th annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education, Tucson, AZ.

Otten, S., Bleiler, K. S., **Engledowl, C.** (2016). *Authority and whole-class proving in a high school geometry class*. Paper presented at the 2016 Annual Meeting of the American Educational Research Association. Washington, D.C.

Engledowl, C., Conner, K. (2015, December). Promoting sense making using PowerPoint and Plotly. Presentation at the 2015 Missouri Council of Teachers of Mathematics Fall Conference. Columbia, MO.

Conner, K., **Engledowl, C.** (2015, December). Promoting sense making using Prezi and PowerPoint. Presentation at the 2015 Missouri Council of Teachers of Mathematics Fall Conference. Columbia, MO.

Otten, S., **Engledowl, C**. (2015, November). Teachers and their students' engagement in mathematical practices. Poster presented at the 37th annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education, East Lansing, MI.

Otten, S., **Engledowl, C.** (2015). *Examining interactions between reasoning and attending to precision in secondary classrooms*. Paper presented at the 2015 Annual Meeting of the American Educational Research Association. Chicago, Il.

Otten, S., **Engledowl, C**., & Spain, V. (2014). *Teachers' developing talk about the mathematical practice of attending to precision*. In S. Oesterle, C. Nicol, P. Liljedahl & D. Allan (Eds.), Paper presented at the 38th conference of the International Group for the Psychology of Mathematics Education and the 36th conference of the North American Chapter (Vol. 6, pp. 191). Vancouver, BC: PME.

Otten, S., **Engledowl, C.,** & Spain, V. (2013). *Understanding and Implementing the CCSSM Practices*. Poster session at The 2nd Studying the Emerging Challenges (SEC^2) of the CCSSM: University of Missouri and University of Georgia. Athens, GA.

Introduction to the TI-*n*spire. Presentation to mathematics education faculty and doctoral students. University of Missouri - Columbia, March 7, 2014.

Getting Acquainted with the TI-Nspire Workshop. Workshop presentation with mathematics education faculty and doctoral students. University of Missouri – Columbia, May 21, 2014.

SERVICE
Service to the Profession

 State of New Mexico

 Member, New Mexico Public Education Department High Quality Instructional Materials Cross Functional Team (June 2019–2022)

 Member, EMS Working Group, established to create a set of Elementary Mathematics Specialist competencies for approval by the state of New Mexico for an endorsement for currently licensed elementary teachers. Working group includes members from New Mexico State University, Western New Mexico University, University of New Mexico, LANL, and New Mexico Highlands University (April 2019–2022)

 Attended The Lieutenant Governor's Conference on Afterschool Learning, organized by New Mexico Lieutenant Governor Howie Morales and hosted by the NMSU College of Education in January 2020 to discuss the significance of afterschool learning for students across New Mexico (January 8, 2020)

Attended the New Mexico Public Education Department Instructional Materials Bureau—High quality Instructional Material: A Foundation for Equity, Excellence, and Relevance conference designed to support school districts across New Mexico in preparing for mathematics textbook adoption processes (December 6–7, 2019)

Co-Facilitator, Calibration Training for Mathematics Instructional Materials Review, New Mexico Public Education Department Instructional Materials Bureau (June 3rd, 2019)

Co-Facilitator, Common Core Mathematics Content and Practices for Instructional Material Review, New Mexico Public Education Department Instructional Materials Bureau (April 12th–13th, 2019)

Consultant, Mathematics Instructional Materials Reviewer, New Mexico Public Education Department Instructional Materials Bureau (March 2019)

Co-Facilitator, Re-envisioning New Mexico's Statewide Assessment System, New Mexico Public Education Department, Deming, NM (March 23rd, 2019)

NMSU Community

Attended The Lieutenant Governor's Conference on Afterschool Learning, organized by New Mexico Lieutenant Governor Howie Morales and hosted by the NMSU College of Education in January 2020 to discuss the significance of afterschool learning for students across New Mexico (January 8, 2020)

Facilitator, Math Explorations Club, Lynn Middle School (Fall 2017, Spring 2018)

Facilitator of small group activity, Lynn Middle School Spring 2018 Community Festival

Manuscript and Book Chapter Reviews

Manuscript Reviewer, Mathematics Teacher: Teaching & Learning PK–12

Manuscript Reviewer, School Science and Mathematics

Manuscript Reviewer, Mathematical Thinking and Learning

Manuscript Reviewer, Investigations in Mathematics Learning

Manuscript Reviewer, Journal of Mathematical Behavior

Book Chapter Reviewer, edited book titled *Quantitative Measures in Mathematical Knowledge: Researching Instruments and Perspectives*

Manuscript Reviewer, Mathematics Teaching in the Middle School

Proposal Reviewer, PME-NA

Proposal Reviewer, AMTE

Broader Field

Graduate Student Mentor, PME-NA 40

Service to the University

Appointed as Faculty Lead of the *Center for Research and Improvement of STEM Teaching and Learning (CRISTL)*. This is a university-level center, and is funded and supported by Office of the Chancellor, Office of the Vice President for Research, the College of Health, Education, and Social Transformation, and the College of Arts and Science.

Participated in Fall 2019 Commencement Ceremony for Graduate Students (December 13, 2019)

Lead Marshall at Spring 2018 Commencement Ceremony (May 12, 2018)

Met with Mathematics Program Review committee to inform them of past collaborations between Mathematics Department and College of Education faculty (October 10, 2017)

Met with CAEP team to inform them of current workings of the secondary education program.

Service to the College of Education

Search Committee Member: SOAR Evaluation & Policy Center Post-Doctoral Position (Fall 2021)

College Council: Academic Affairs Committee Member

Participated in the Fall 2019 College of Education Academic Excellence Awards and Doctoral Recognition Ceremony (December 13, 2019)

Attended the Quality Education for Minorities (QEM) Network's *Workshop to Assist Minority-Serving Institutions to Prepare and Submit Competitive Proposals in the 2019 NSF Robert Noyce Teacher Scholarship Program Competition* (May 31–June 1, 2019)

College of Education Freshman Welcome Celebration and Coin Challenge (August 23rd, 2019)

Working Group Member, Statistical Sequence (September 2017–2022)

Hosted a live stream of the MERDS Early Career Lecture by Teddy Chao, titled Teaching mathematics so all students love it: Using equity, listening, and creative insubordination in your classroom, given at the University of Missouri on 10/13/17.

Service to the Department

Program Coordinator: MAE: Elementary Math/Science (March 2021–May 2022)

EDLT, Research Methods, and MAE: Elementary Math/Science Program Coordinator (March 2021–May 2021)

Search Committee Member: Temporary College Instructor, EDLT (March-April 2021)

College Council: Academic Affairs Committee Member

Creating Master of Arts in Education: Elementary Mathematics and Science degree concentration within Curriculum & Instruction. Duties include creating CAFs for 5 new graduate level EDUC courses, corresponding with and meeting with various science department faculty members about their roles within the concentration (Biology, Physics, Engineering), collecting information and writing necessary arguments to submit the curriculum change form document to establish the concentration, weekly meetings with other program partners.

Other program partners: Wanda Tamez-Bulger (MC^2), Lisa Matthews (MC^2), Megan Kidwell (MC^2), Erika Acosta (MC^2), Ted Stanford (Mathematics Department), Pat Morandi (Mathematics Department)

College of Education Freshman Welcome Celebration and Coin Challenge (August 23rd, 2019)

TEP Reads

STEP Reads

Master's Exam Reads

Doctoral Intakes

LEADERSHIP

Appointed as Faculty Lead of the *Center for Research and Improvement of STEM Teaching and Learning (CRISTL)*. This is a university-level center, and is funded and supported by Office of the Chancellor, Office of the Vice President for Research, the College of Health, Education, and Social Transformation, and the College of Arts and Science.

Created Master of Arts in Education: Elementary Mathematics & Science degree concentration within Curriculum & Instruction (Summer/Fall 2019).

Manage MAE: Elementary Mathematics & Science degree program (Summer 2020– Spring 2021)

Presented and defended the MAE: Elementary Mathematics & Science degree program as an NMPED-approved pathway to the Elementary Mathematics Specialist Endorsement to the state PPSC committee (approval with conditions, Nov 2020)

PROFESSIONAL DEVELOPMENT

2015   Attended the 37th Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education, East Lansing, MI: Michigan State University.

2015   Attended the American Education Research Association 2015 Conference in Chicago, Il.

2015   Attended the Introduction to Matching and Propensity Score Analysis webinar

2014   Attended the Missouri Mathematics Association for the Advancement of Teacher Training (MAT^2) at the University of Missouri – Columbia.

2014   Attended NCTM Research Conference in New Orleans, LA

2013   Attended The 2nd Studying the Emerging Challenges (SEC^2) of the CCSSM at the University of Georgia, Athens, GA.

PROFESSIONAL AFFILIATIONS

National Council of Teachers of Mathematics (NCTM)

Association of Mathematics Teacher Educators (AMTE)

Florida Association of Mathematics Teacher Educators (FAMTE)

Research Council on Mathematical Learning (RCML)

North American Chapter of the International Group for the Psychology of Mathematics Education (PME-NA)

Society for Information Technology & Teacher Education (SITE)

American Education Research Association (AERA)

Missouri Council of Teachers of Mathematics