

Frederick A. Peck

Department of Mathematical Sciences, University of Montana, Missoula, MT
f@fapeck.com | +1 (406) 243 4053 | www.fapeck.com | @frederickpeck

PROFESSIONAL EXPERIENCE

- 2015-Present Assistant professor of Mathematics Education
Department of Mathematical Sciences, University of Montana
- 2013-2015 Instructor
School of Education, University of Colorado
- 2006-2012 Math teacher
Centaurus High School, Lafayette CO

EDUCATION

- 2015 PhD University of Colorado Boulder
Curriculum and instruction, Mathematics education
Dissertation title: The intertwining of activity and artifacts: A cultural perspective on Realistic Mathematics Education
- 2006 MA University of Colorado Boulder
Curriculum and instruction: Math education
Coursework in mathematics equivalent to an undergraduate major in mathematics
- 2002-2004 PhD Student University of Michigan
Human Computer Interaction
- 2001 BA Carnegie Mellon University
Business administration: Computing and information technology, awarded with University Honors

AREAS OF INTEREST AND SPECIALIZATION

Mathematics education, realistic mathematics education, cultural-historical approaches to human learning, mathematics for social justice, design research, discourse analysis, psychometrics and educational measurement

PEER REVIEWED PUBLICATIONS

Journal publications

- 2020 **Peck, F.A.** (2020). Beyond rise over run: A learning trajectory for slope. *Journal for Research in Mathematics Education*, 51(4), 433–467.
<https://doi.org/doi:10.5951/jresmetheduc-2020-0045>
- 2020 **Peck, F. A.** (2020). Towards anti-deficit education in undergraduate mathematics education: How deficit perspectives work to structure inequality and what can be done about it. *PRIMUS* (online first).
<https://doi.org/10.1080/10511970.2020.1781721>
- 2020 Renga, I.P., **Peck, F.A.**, Feliciano-Semidei, R., Erickson, D. & Wu, K. (2020). Doing math and talking school: Professional talk as producing hybridity in teacher identity and community. *Linguistics and Education*, 55, 100766.
<https://doi.org/10.1016/j.linged.2019.100766>
- 2018 * **Peck, F.A.** (2018). Rejecting Platonism: Recovering humanity in mathematics education. *Education Sciences*, 8(43). <https://doi.org/10.3390/educsci8020043>
* Special issue on myths in mathematics education, edited by Jo Boaler
- 2017 **Peck, F.A.** & Sriraman, B. (2017). Breaking the constraints of modernist psychologizing: Mathematics education flirts with the postmodern. *Interchange*, 48, 351-362. <https://doi.org/10.1007/s10780-017-9306-1>
- 2016 **Peck, F.A.** & Matassa M. (2016). Reinventing fractions and division as they are used in algebra: The power of preformal productions. *Educational Studies in Mathematics*, 92, 2, 245-278. <https://doi.org/10.1007/s10649-016-9690-y>
- 2015 Briggs, D. and **Peck, F.A.** (2015). Rejoinder to commentaries on Using learning progressions to design vertical scales that support coherent inferences about student growth. *Measurement: Interdisciplinary Research and Perspectives* 13, 3-4, 206-218. <https://doi.org/10.1080/15366367.2015.1104113>
- 2015 * Briggs, D. and **Peck, F.A.** (2015). Using learning progressions to design vertical scales that support coherent inferences about student growth. *Measurement: Interdisciplinary Research and Perspectives* 13, 2, 75-99.
<https://doi.org/10.1080/15366367.2015.1042814>
* Focus article. Commentaries from Jere Confrey; Seth Jones, & Garron Gianopulus; Andrew Ho; Neal Kingston, Angela Broaddus & Hongling Lao; Andrew Maul; Joshua McGrane; Scott Marion; Joseph Martineau & Adam Wyse; William Penuel; David Thissen

- 2015 O’Conner, K., **Peck, F.A.**, and Cafarella, J. (2015) Struggling for legitimacy: Trajectories of membership and naturalization in the sorting of engineering students. *Mind, Culture, and Activity* 22, 2, 168-183. <https://doi.org/10.1080/10749039.2015.1025146>
- 2010 Bhavnani, S.K., and **Peck, F.A.** (2010). Scatter matters: Regularities and implications for the scatter of healthcare information on the web. *Journal of the American Society for Information Science and Technology* 61, 4, 659–676. <https://doi.org/10.1002/asi.21217>
- 2008 Bhavnani, S.K., **Peck, F.A.**, and Reif, F. (2008). Strategy-Based Instruction: Lessons learned in teaching the effective and efficient use of computer applications. *ACM Transactions on Computer-Human Interaction* 15, 1, 2:1-2:43. <https://doi.org/10.1145/1352782.1352784>
- 2006 Bhavnani, S.K., Bichakjian, C.K., Johnson, T.M., Little, R.J., **Peck, F.A.**, Schwartz, J.L., and Strecher, V.J. (2006). Strategy Hubs: Domain portals to help find comprehensive information. *Journal of the American Society for Information Science and Technology* 57, 1, 4-24. <https://doi.org/10.1002/asi.20238>

Journal publications *in review* or *in revision*

- 2020 (in revision) **Peck, F.A.** (2020, in revision) Learning events with non-human participants: The role of second stimuli. In revision.
- 2020 (in review) **Peck, F.A.**, Johnson, R.J., Briggs, D.C., & Alzen, J.A. (2020, in review). Towards learning trajectory-based instruction: A framework for teachers’ conceptions of learning and assessment. In review.
- 2020 (in review) Renga, I.P., **Peck, F.A.**, Wu, K., & Erickson, D. (2020, in review). Towards professional *loving* communities
- 2019 (in revision) O’Connor, K., **Peck, F.A.**, Cafarella, J., McWilliams, J. & Tsai, J. (2019, in revision). Working in the weeds: Dilemmas of practice and the discursive production of success and failure. In revision.

Peer-reviewed papers published in conference proceedings

- 2017 **Peck, F.A.**, Erickson, D., Feliciano-Semidei, R., Renga, I. Roscoe, M., & Wu, K. (2017, October). Negotiating the essential tension of teacher communities in a statewide Math Teachers' Circle. *Proceedings of the 39th annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education*. Indianapolis, IN.
- 2016 **Peck, F. A.**, O'Connor, K., Cafarella, J., & McWilliams, J. (2016, October). How borders produce persons: The case of calculus in engineering school. 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* (pp. 1079–1086). Tucson, AZ: The University of Arizona.
- 2016 O'Connor, K., **Peck, F.A.**, McWilliams, J. & Cafarella, J. (2016, June). Working in the weeds: How do instructors sort engineering students from non-engineering students in a first year pre-calculus course? *Proceedings of the 2016 American Society for Engineering Education Annual Conference and Exposition*, New Orleans, LA.
- 2015 O'Connor, K., **Peck, F.A.**, & Cafarella, J. (2015). Constructing “calculus readiness”: Struggling for legitimacy in a diversity-promoting undergraduate engineering program. *Proceedings of the 2015 American Society for Engineering Education Annual Conference and Exposition*, Seattle, WA: ASEE. 26.397.1-26.397.17
- 2015 O'Connor, K., McWilliams, J., **Peck, F.A.**, & Cafarella, J. (2015). Ideologies of depoliticization in engineering education: A Mediated Discourse Analysis of student presentations in a first-year projects course *Proceedings of the 2015 American Society for Engineering Education Annual Conference and Exposition*, Seattle, WA: ASEE. 26.880.1-26.880.17
- 2012 **Peck, F.A.** & Matassa M. (2012). Ratio and rate: Towards a unified framework. *Proceedings of the 12th International Conference on Mathematics Education*. Seoul, Korea
- 2012 Matassa, M. & **Peck, F.A.** (2012). Rise over run or rate of change? Exploring and expanding student understanding of slope in Algebra I. *Proceedings of the 12th International Congress on Mathematics Education*. Seoul, Korea. 7440-7445.

- 2006 Bhavnani, S.K., and **Peck, F.A.** (2006). Towards a model of information scatter: Implications for search and design. *Proceedings of the 2006 meeting of the American Society for Information Science and Technology*.
- 2004 **Peck, F.A.**, Bhavnani, S.K., Blackmon, M.H., and Radev, D.R. (2004). Exploring the use of natural language systems for fact identification: Towards the automatic construction of healthcare portals. *Proceedings of the 2004 meeting of the American Society for Information Science and Technology*, 327-338.
- 2003 Bhavnani, S.K., Bichakjian, C.K., Johnson, T.M., Little, R.J., **Peck, F.A.**, Schwartz, J.L., and Strecher, V.J. (2003). Strategy Hubs: Next-generation domain portals with search procedures. *Proceedings of the 2003 ACM CHI conference on Human Factors in Computing Systems*, 393-400.
- 2003 Bhavnani, S.K., Jacob, R.T., Nardine, J., and **Peck, F.A.** (2003). Exploring the distribution of online healthcare information. *Proceedings of the 2003 ACM CHI conference on Human Factors in Computing Systems*, 816-817.

Book chapters

- 2019 Webb, D.C., & **Peck, F.A.** (2020). From tinkering to practice — The role of teachers in the application of Realistic Mathematics Education principles in the United States. In M. van den Heuvel-Panhuizen (Ed.), *International reflections on the Netherlands didactics of mathematics: Visions on and experiences with Realistic Mathematics Education* (pp. 21–39). Springer.

GRANTS AND EXTRAMURAL FUNDING

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|-----------|-------------|---|
| 2018-2021 | \$1,039,100 | Montana Models: Connecting Local and Disciplinary Practices through University-Community Partnerships
Funder: NSF, AISL program
Award number 1810992 |
| 2018 | \$39,300 | Broadening Participation through Innovations in Concurrent Enrollment
Funder: Montana Office of the Commissioner of Higher Education –
Award Number S367B160023 |
| 2017-2018 | \$15,000 | Exploring the Montana Math Teachers’ Circle
Funder: University of Montana Grants Program |
| 2017-2018 | \$114,980 | Problem solving pathways to concurrent enrollment courses
Funder: Montana Office of the Commissioner of Higher Education –
Award Number S367B160023 |

2017	\$32,300	STEM is cool Montana (SICM) Funder: Montana GEARUP
2016-2017	\$49,983	The Montana Math Teachers' Circle Funder: NSA, MEPP program
2016-2017	\$5,000	Exploring Math Teachers' Circles Funder: University of Montana Grants Program
2015-2016	\$109,000	Montana Math Teachers' Circle Funder: Montana Office of the Commissioner of Higher Education – Award Number S367B140023-14A
2008-2010	\$65,000	Double-dose of mathematics for struggling learners Funder: Impact on Education

AWARDS AND FELLOWSHIPS

2020	Helen and Winston Cox Educational Excellence Award Awarded by the University of Montana
2020	Dr. Bill Stannard Awards for Excellence in Teaching in Montana Awarded by Montana State University
2016	“Best should teach” award Awarded by the University of Colorado Boulder
2011-2013	Chancellor’s fellow Awarded by the University of Colorado Boulder (The most prestigious fellowship offered by the University)
2009	Teacher of the year Awarded by Centaurus High School, Lafayette, CO

ADDITIONAL (NON-PEER REVIEWED) PUBLICATIONS

Reports and working papers

2015	Briggs, D.C., Diaz-Bilello, E., Peck, F.A. , Alzen, J., Chattergoon, R., & Johnson, R. (2015). <i>Using a Learning Progression Framework to Assess and Evaluate Growth</i> . Center for Assessment, Design, Research and Evaluation (CADRE) Working Paper.
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- 2015 Briggs, D.C., **Peck, F.A.**, Johnson, R., & Alzen, J. (2015). *The Learning Progression Project: Year 2 pilot findings: Mathematics*. Center for Assessment, Design, Research and Evaluation (CADRE). Report for Denver Public Schools.
- 2014 Briggs, D.C., Diaz-Bilello, E., **Peck, F.A.**, Alzen, J., Chattergoon, R., & McClelland, A. (2014). *Tier 3 Student Learning Objective Pilot: Documentation of Pilot Work and Lessons Learned in the 2013- 2014 School Year*. Center for Assessment, Design, Research and Evaluation (CADRE). Report for Denver Public Schools.

Mainstream media and other publications

- 2020 Carlson, M.A., & **Peck, F.A.** (2020). Math outside the classroom. *Lives & Landscapes Magazine*, (Spring), 4–5.
<https://apps.msuetextension.org/magazine/articles/5450>
- 2018 **Peck, F.A.** (2019). Learning to be less helpful. *AMS: On Teaching and Learning Mathematics*. <https://blogs.ams.org/matheducation/2018/12/17/learning-to-be-less-helpful/>
- 2017 **Peck, F.A.**, & Erickson, D. (2017). The rise—and possible fall—of the graphing calculator. *The Conversation*. <https://theconversation.com/the-rise-and-possible-fall-of-the-graphing-calculator-78017>
- 2016 **Peck, F.A.**, Alzen, J., Briggs, D.C., & Johnson, R.J. (2016). Developing purposeful questions and analyzing student reasoning: Two tools. *Colorado Mathematics Teacher*. Winter, 2016. 18-24.
- 2013 Migozuchi, T., **Peck, F.A.**, & Matassa, M. (2013). Developing robust understandings of slope. *Elementary mathematics teaching today*, 511. 31-32.

PRESENTATIONS AT SCIENTIFIC AND PROFESSIONAL MEETINGS

Peer-reviewed conference presentations

- 2020 (postponed) * **Peck, F.A.**, Carlson, M.A., Burroughs, E., Adeolu, A., Killeen, S., McWalters, K. (2021). *Leveraging community resources and student agency through mathematical modeling*. Accepted presentation at the 2020 TODOS Conference, Scottsdale, AZ.

* Conference postponed until 2021 due to Coronavirus pandemic

- 2020 (accepted; postponed) **Peck, F.A.**, Carlson, M.A., Adeolu, A., Killeen, S., McWalters, K. (2021). *Problem solving dispositions in rural communities*. Accepted poster presentation at the 2020 annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education. Matzalán, Sin. México
- 2019 **Peck, F.A.**, Alzen, J., Briggs, D.C., & Johnson, R. (2019, Sept). *Using learning progressions to support a classroom learning and assessment system: The Learning Progression Framework*. Presented at the National Council for Measurement in Education Conference on Classroom Assessment. Boulder, CO
- 2018 **Peck, F. A.**, Erickson, D., Feliciano-Semidei, R., Renga, I. P., & Wu, K. (2018, April). *What does it mean to “do math” in a math teachers’ circle?* Presented at the 2018 National Council of Teachers of Mathematics Research Conference. Washington, D.C.
- 2016 **Peck, F.A.** (2016, April). *The intertwinement of activity and artifacts in Realistic Mathematics Education*. Presented at the National Council for Teachers of Mathematics Research Conference. San Francisco, CA.
- 2016 * Johnson, R.J., **Peck, F.A.**, Briggs, D. & Alzen, J. (2016, April). *A unified framework of teachers’ conceptions of learning and assessment*. Presented at the National Council for Teachers of Mathematics Research Conference. San Francisco, CA.
- * Johnson and Peck, co-first authors
- 2016 Briggs, D.C & **Peck, F.A** (2016, April). *Enacting a learning progression design to measure growth* (symposium, opening presentation). Presented at the Annual Meeting of the National Council on Measurement in Education. Washington, DC
- 2016 O’Connor, K., **Peck, F.A.**, Cafarella, J. & McWilliams, J. (2016, April). Producing calculus (un)readiness. Presented at the Annual Meeting of the American Educational Research Association. Washington, DC.
- 2015 O’Connor, K., Cafarella, J., McWilliams, J. & **Peck, F.A.**, (2015, October) *Struggling for legitimacy in engineering education*. Presented at the Annual meeting of the American Anthropological Association. Denver, CO.
- 2015 **Peck, F.A.** (2015, September). *Emergent modeling: From chains of signification to cascades of artifacts*. Presented at the Fifth International Realistic Mathematics Education Conference, Boulder, CO, Sept 17-20.

- 2015 * Johnson, R.J., **Peck, F.A.**, Campbell, W.C, Grover, R., Miller, S., & Scroggins, A. (2015, September). *An orientation to Realistic Mathematics Education*. Presented at the Fifth International Realistic Mathematics Education Conference, Boulder, CO, Sept 17-20.
- * Johnson and Peck, co-first authors and session organizers
* Invited plenary talk
- 2015 **Peck, F.A.** (2015, April). *Activity situates: How epistemic mathematical activity and social organizations become dialectically intertwined in the mangle of conceptual practice*. Presented at the Annual Meeting of the American Educational Research Association. Chicago, IL.
- 2015 * Cafarella, J., & **Peck, F.A.** (2015, April), *Decentering dominant discourses and reimagining privileged spaces in STEM education*. Annual Meeting of the American Educational Research Association (Nancy Aers, chair; Megan Bang, discussant). Chicago, IL.
- * Cafarella and Peck, session organizers
- 2015 Briggs, D.C., **Peck, F.A.**, Alzen, J. & Johnson, R.J. (2015, April). *Implementing a learning progression-based approach to Student Learning Objective development: Results from a pilot test in three schools*. Presented at the Annual Meeting of the American Educational Research Association. Chicago, IL.
- 2014 **Peck, F.A.** (2014, April). *Beyond rise over run: A local instructional theory for slope*. Presented at the National Council for Teachers of Mathematics Research Conference. New Orleans, LA
- 2013 **Peck, F.A.** (2013, September). *How does reinvention get distributed?* Presented at the Fourth International Realistic Mathematics Education Conference. Boulder CO
- 2013 **Peck, F.A.** (2013, September). *Beyond rise-over-run: Contexts, representations, and a learning trajectory for slope*. Presented at the Fourth International Realistic Mathematics Education Conference. Boulder CO
- 2013 **Peck, F.A.** (2013, April). *"I think it's a hundred and fifteen dollars": How mathematical activity and the social setting are mutually informing and co-constitutive*. Poster presented at the 2013 National Council for Teachers of Mathematics Research Conference. Denver, CO

- 2011 **Peck, F.A.**, and Moeller, J. (2011, September). *Length times width equals area and line times line equals parabola: Incorporating two RME models into a cohesive learning trajectory for quadratic functions*. Presented at the Third International Realistic Mathematics Education Conference. Boulder CO

Invited talks and session chairs

- 2018 What does it mean to “do math” in a math teachers’ circle? (Invited talk)
Department of Mathematical Sciences, Montana State University, Bozeman, MT
- 2018 The Montana Math Teachers’ Circle (Invited talk).
Symposium on Montana Mathematics Teaching. Anaconda, MT
- 2017 Expanding the perimeter: The Montana Math Teachers’ Circle (Invited talk).
Symposium on Montana Mathematics Teaching. Anaconda, MT
- 2015 An orientation to Realistic Mathematics Education (Invited plenary talk).
Fifth International Realistic Mathematics Education Conference. Boulder CO
- 2015 Investigations into elementary students’ mathematical thinking (Invited chair).
Annual Meeting of the American Educational Research Association. Chicago, IL
- 2015 Using models to solve math problems: The area model (Invited talk).
Courage to Risk Conference. Colorado Springs, CO (Jan 2015)
- 2015 Using models to solve math problems: The number line (Invited talk).
Courage to Risk Conference. Colorado Springs, CO (Jan 2015)
- 2015 Using models to solve math problems: The ratio table (Invited talk).
Courage to Risk Conference. Colorado Springs, CO (Jan 2015)

Presentations at practitioner (teacher-focused) conferences

- 2020 (canceled) * Johnson, R.J., **Peck, F.A.** & Webb, D.C. (2020, April). *Making meaning of systems of equations with contexts and representations*. Accepted to the Annual Meeting of the National Council of Teachers of Mathematics. Chicago, IL.
* Conference canceled due to Coronavirus pandemic
- 2020 (canceled) * Killeen, S., Kotthoff, M., & **Peck, F.A.** (2020, June). *Mathematics as disciplined creativity*. Accepted to the Montana OPI Summer Institute. Bozeman, MT.
* Conference canceled due to Coronavirus pandemic

- 2020 (canceled) * **Peck, F.A.** (2020, June). *Broadening participation in grade-level mathematics by detracking: Extended session*. Accepted to the Montana OPI Summer Institute. Bozeman, MT.
- * Conference canceled due to Coronavirus pandemic
- 2019 **Peck, F.A.** (2019, October). *Making logarithms meaningful through progressive formalization*. Montana Educator's Conference, Belgrade, MT.
- 2019 **Peck, F.A.** (2019, October). *Let's do math! Mathematical practices and the Montana Math Teachers' Circle*. Montana Educator's Conference, Belgrade, MT.
- 2019 Linhart, C., Carlson, M.A., & **Peck, F.A.** (2019, October). *Bringing in the world: Making mathematics meaningful through modeling*. Montana Educator's Conference, Belgrade, MT.
- 2019 **Peck, F.A.** (2019, June). *Broadening participation in grade-level mathematics by detracking*. Presented at the Montana OPI Summer Institute. Bozeman, MT
- 2019 Killeen, S., Kotthoff, M., & **Peck, F.A.** (2019, June). *Problem posing and problem solving*. Presented at the Montana OPI Summer Institute. Bozeman, MT.
- 2019 Webb, D.C., Johnson, R.J., & **Peck, F.A.** (2019, April). *Making logarithms meaningful through progressive formalization*. Presented at the Annual Meeting of the National Council of Teachers of Mathematics. San Diego, CA.
- 2018 **Peck, F.A.** (2018, October). *Building meaning into algebra equations with multiple representations and progressive formalization*. Presented at the Montana Educators' Conference, Billings, MT.
- 2018 Kotthoff, M., Erickson, D. & **Peck, F.A.** (2018, June). *The Montana Math Teachers' Circle*. Presented at the Montana Behavioral Institute. Bozeman, MT.
- 2018 **Peck, F.A.**, Johnson, R.J., & Webb, D.C. (2018, April). *Building meaning into algebra equations with multiple representations and progressive formalization*. Presented at the Annual Meeting of the National Council of Teachers of Mathematics. Washington, DC.
- 2018 Roscoe, M.B., & **Peck, F.A.** (2018, April). *Motivating investigations of probability with Russian Egg Roulette*. Presented at the Annual Meeting of the National Council of Teachers of Mathematics. Washington, DC.

- 2017 Cobbs, G.A., & **Peck, F.A.** (2017, October). *Cryptography in the classroom and afterschool clubs*. Presented at the Montana Educators' Conference, Missoula, MT.
- 2017 Roscoe, M.B., & **Peck, F.A.** (2017, October). *Russian Egg Roulette: A motivating probabilistic setting*. Presented at the Montana Educators' Conference, Missoula, MT.
- 2017 **Peck, F.A.** (2017, June). *Problem solving in a math teachers' circle*. Presented at the Montana Behavioral Institute. Bozeman, MT.
- 2016 **Peck, F.A.** (2016, October). *Beyond rise over run: Activities to invent and connect slope's five faces*. Presented at the MEA/MFT Educators' Conference, Helena, MT.
- 2016 Johnson, R.J., & **Peck, F.A.** (2016, April). *Modeling your way to understanding with Realistic Mathematics Education*. Presented at the Annual Meeting of the National Council of Teachers of Mathematics. San Francisco, CA. April, 2016
- 2016 Roscoe, M.B. & **Peck, F.A.** (2016, February). *The Montana Math Teachers' Circle: Mathematical inquiry for teachers*. Presented at the Montana Math/Science Leadership Conference. Bozeman, MT
- 2014 **Peck, F.A.** (2014, September). *Beyond rise over run: Activities to invent and connect slope's five faces*. Presented at the Annual Meeting of the Colorado Council of Teachers of Mathematics. Denver, CO
- 2014 **Peck, F.A.** (2014, April). *Beyond rise over run: Activities to invent and connect slope's five faces*. Presented at the Annual Meeting of the National Council of Teachers of Mathematics. New Orleans, LA
- 2010 **Peck, F.A.**, and Moeller, J. (2010, September). *Length times width equals area and line times line equals parabola: Two models to enable the mathematization of contexts into quadratic functions*. Presented at the Annual Meeting of the Colorado Council of Teachers of Mathematics. Denver, CO
- 2010 **Peck, F.A.**, and Moeller, J. (2010, April). *From informal models to formal algebra: Using technology to facilitate progressive formalization in Algebra I*. Presented at the Regional Meeting of the National Council of Teachers of Mathematics. Denver, CO
- 2008 **Peck, F.A.** (2008, September). *Dynamic calculus using Sketchpad*. Presented at the Annual Meeting of the Colorado Council of Teachers of Mathematics. Denver, CO

2008 **Peck, F.A.** (2008, September). *Reading, writing, and 'rithmetic: Incorporating literacy in the math classroom*. Presented at the Annual Meeting of the Colorado Council of Teachers of Mathematics. Denver, CO

TEACHING AND ADVISING

Courses taught

2015-present Assistant professor, University of Montana

Undergraduate courses taught:

- M132, Number and operations for K-8 teachers. (Fall 2015, Spring 2016, Fall 2016, Spring 2017, Fall 2017, Spring 2018; Spring 2019; Spring 2020)
- M429: History and nature of mathematics. (Spring 2017)

Graduate courses taught (MA and PhD):

- M500, Contemporary mathematics curricula (Spring 2016, Spring 2017; Spring 2019)
- M504, Seminar: Alternative forms of knowing in mathematics (Fall, 2017)
- M504, Seminar, Humanizing mathematics (Fall, 2019)
- M510, Problem solving for teachers (Fall 2017, Fall 2019)
- M572, Algebra for teachers (Summer 2016, Summer 2018, Summer 2020)
- M574, Teaching probability and statistics from a problem-solving perspective (Summer 2017)
- M595, Qualitative research methods (Spring, 2018)
- M595, Teaching and learning in Calculus (Spring, 2019)
- M602, Teaching college mathematics (Fall 2016, Spring 2020)

Course and program coordinator

- MA in Teaching School Mathematics (2018-present)
- Mathematics for K-8 teachers course sequence (2019-2020)

2013-2015 Instructor, University of Colorado

Undergraduate courses taught:

- EDUC 5375, Problem-based instruction for math and science teachers (Spring 2015)

Graduate courses taught

- Statistical reasoning (Summer 2013, Summer 2014)

2002-2004 Graduate student instructor, University of Michigan

Undergraduate courses taught: Strategic use of computer applications

2006-2012 Math teacher, Centaurus High School, Lafayette CO
Courses taught: Calculus III, AP calculus AB & BC, IB math HL, IB math SL,
Algebra I, Math workshop
Grades: 9-12

PhD students: Primary advisor or committee member (listed by graduation year)

Present Christian Lopez-Mercado (primary advisor)
Kathleen Hill (committee member)

2019 Ricela Feliciano-Seimedi (committee member)

2016-2018 Roger Madplume (did not graduate)

Masters students: Primary advisor only (listed by graduation year)

Present Sara Killeen
Dennisse Kundig
Baleigh Doyle

2020 Caleb Huber
Cara Lokken-Fransden

2019 Sarah Liepheimer
Emily Wilson

2018 Raymond DeBruycker

2016 Gregg Feddes
Christopher Linhart

Undergraduate research projects advised

2017-2018 Eleni Fragkouli and Glen Woodworth
Project: Investigating beliefs about mathematics in “thinking classrooms”

High school research projects advised

2019-2020 Maxim Winters (Hellgate High School, Missoula MT)
Project: Determining the Existence of a Universal Constant for Inverse Variation Functions
and Other Hyperbolas
*Winner: Mu Alpha Theta Award for most challenging, thorough, & creative investigation of a
mathematics problem*

RESEARCH PROJECTS

- 2018-present Co-Principal investigator
Project title: Montana Models: Connecting Local and Disciplinary Practices through University-Community Partnerships
Project description: Critical ethnography to understand local mathematical practices in rural and indigenous communities, design-based research to develop activities for youth that bring these local practices into contact with disciplinary practices.
- 2016-present Principal Investigator
Project title: Exploring Math Teachers' Circles
Description: Field-based ethnography studying identity and community formation in Math Teachers' Circles.
- 2011-present Principal Investigator
Project title: Rise over run or rate of change: Exploring and expanding student understandings of slope in Algebra I
Description: Design study exploring the ways that students reinvent, make-meaningful, and connect multiple sub-constructs of slope in Algebra I.
- 2013-2016 Co-Investigator (2015-present); Graduate research assistant (2013-2015)
Grant title: Inclusive excellence to bolster diversity:
A system of capacity-building pathways to and through engineering
PI: Jacquelyn Sullivan, Kevin O'Connor
Description: Field-based ethnography studying a diversity program in a college of engineering. Collaboration with researchers in the College of Engineering.
- 2013-2015 Graduate research assistant
Project title: The learning progressions project: Making SLOs useful.
Faculty director: Derek Briggs
Description: Research-practice partnership with an urban school district to develop and study a method of measuring student growth using learning progressions.
- 2002-2004 Graduate research assistant
Project title: Developing tools to help users find comprehensive healthcare information on the World Wide Web
Faculty director: Suresh Bhavnani
Description: Explored the distribution of healthcare information on the Web; designed, developed, and tested (in a randomized controlled trial) a domain-specific search tool to provide strategic search procedures to help users find comprehensive healthcare information.

SERVICE TO THE DEPARTMENT AND PROFESSION

- 2012 – Present Reviewer for:
Journal for Research in Mathematics Education (JRME);
Journal for Teacher Education (JTE);
Mathematics Thinking and Learning (MTL);
School Science and Mathematics;
Education Sciences;
Sustainability;
Journal of Math Circles;
American Educational Research Association annual conference (AERA);
International Conference on the Learning Sciences (ICLS);
National Council of Teachers of Mathematics research conference (NCTM);
National Council for Measurement in Education Conference on Classroom Assessment (NCME);
Psychology of Mathematics Education (North American chapter) annual conference (PME-NA);
Realistic Mathematics Education conference (RME);
Computer Supported Cooperative Learning conference (CSCL)
- 2016-present Montana Math Teachers' Circle:
Statewide coordinator (manage registration and recruiting, coordinate lead teams at nine locations across the state. ~30 teacher leaders, ~450 participating teachers)
Lead team member and facilitator, Missoula chapter of the Montana Math Teachers' Circle
- 2016-present Committee service
Department of Mathematical Sciences, University of MT:
Graduate committee (2016, 2017, 2018, 2019, 2020)
Policy committee (2016, 2017, 2018, 2019, 2020)
Lott Scholarship committee (2017, 2018, 2019, 2020)
Lennes Contest committee (2017, 2018, 2019, 2020) Committee chair: 2020
Faculty Evaluation committee (2017)
University of MT
Montana Tribal Nation outreach and listening tour (2018, 2019)
Howard Hughes Medical Institute *Driving Change* Initiative (2019, 2020)
- 2016-present Co-organizer and session facilitator, Montana Math Day for secondary students (~250 students from across Western Montana)
- 2018-present Co-organizer, Montana High School Math Award
- 2018-present Mentor, Montana Supports the Mathematicians of Tomorrow

- 2019 Collaborator, Detracking and co-requisite course initiative, Belt Public Schools, Belt, MT (Collaboration with high school math teachers and administrators)
- 2018 Reviewer for the National Education Policy Center’s “Schools of Opportunity”
- 2018 Program Committee member, International Conference of the Learning Sciences
- 2017-2018 Panel member, Study of the Alignment of NAEP with Current Generation State Assessments Based on College and Career Ready (CCR) Standards
- 2017 Lead writer, Academic Program and Administrative Services Prioritization (APASP) Report. Program: Masters of Arts in Teaching Middle School Mathematics.
- 2017 Statewide organizer, Montana Cryptoclub
- 2015-2016 Mentor, Standards-based Teaching, Renewing Educators Across Montana in Mathematics (STREAM)
- 2015 Co-organizer, Montana Math Circle for high school students
- 2014 Co-author, “Family and community guides to the Colorado Academic Standards,” Colorado Department of Education
Online: <http://www.cde.state.co.us/standardsandinstruction/guidestostandards-6thru12>
- 2013-2015 Steering committee, *Math on the “planes”* conference, (~200 attendees per year), Colorado Council for Learning Disabilities
- 2013-2015 Advisory board for PhET interactive simulations, University of Colorado Boulder
- 2013-2015 Ambassador for the Curriculum & Instruction Math/Science doctoral program, School of Education, University of Colorado Boulder
- 2007-2012 Boulder Valley School District Curriculum Coordinating Council
- 2006-2012 Boulder Valley School District Mathematics Curriculum Council

Professional development for teachers

- 2018 Sussex School (Missoula, MT)
Engaging students in mathematical practices
- 2018 Montana Office of the Commissioner of Higher Education
Title: Broadening participation in mathematics (online course)
- 2013-2015 Denver Public School District and University of Colorado
Title: The learning progressions project: Making SLOs meaningful

- 2014-2015 Cherry Creek School District
Title: SLD Intervention Workshops: Accessing grade-level content
- 2015 Colorado Council for Learning Disabilities
Title: Understanding structure to aid in mathematical problem-solving
- 2014 Colorado Department of Education
Title: Algebraic reasoning for students with SLD
- 2014 Colorado Council for Learning Disabilities
Title: Using mathematical models to do and learn mathematics
- 2013 Colorado Council for Learning Disabilities
Title: The five faces of fractions and rational numbers

Conferences and camps for teachers and youth

- 2019 Montana Models summer camp
Participants: youth from rural communities (~45 attendees, 5 days)
Co-organizer and facilitator
- 2019 Montana Summer Institute for Math Teachers: Mathematics as “disciplined creativity”
Participants: K-16 math teachers (~30 attendees, 4 days)
Organizer and facilitator
- 2019 Montana American Indian Math and Science (MT AIMS) summer camp.
Participants: Middle school youth from the Blackfeet Nation (~30 attendees, 5 days)
Facilitator
- 2018 Montana Math Teachers’ Circle Lead Team Conference
Participants: K-16 math teachers (~30 attendees, 3 days)
Co-organized with the American Institute of Mathematics (AIM)
- 2018 Association of Indigenous Math Circles summer camp.
Participants: Youth, primarily from the Navajo Nation (~45 attendees, 2 weeks)
Facilitator
- 2018 Montana Summer Institute for Math Teachers: Problem Posing
Participants: K-16 math teachers (~30 attendees, 4 days)
Organizer and facilitator
- 2017 Montana Math Teachers’ Circle Lead Team Conference
Participants: K-16 math teachers (~25 attendees, 3 days)
Co-organized with the American Institute of Mathematics (AIM)

- 2017 STEM is cool Montana
Participants: Middle school youth from the Fort Belknap Indian Community and Crow Nation (~30 participants, 2 weeks)
Co-organizer and facilitator
- 2017 Montana Summer Institute for Math Teachers: Problem Solving
Participants: K-16 math teachers (~45 attendees, 1.5 weeks)
Co-organizer and facilitator
- 2016 Montana Math Teachers' Circle Lead Team Conference
Participants: K-16 math teachers (~35 attendees, 3 days)
Co-organized with the American Institute of Mathematics (AIM)
- 2016 Montana Summer Institute for Math Teachers
Participants: K-16 math teachers (~30 attendees, 4 days)
Co-organizer and facilitator
- 2015 Math on the "Planes" Annual Conference: Models, structure, and strategies for algebra equations
Participants: K-16 math teachers and intervention teachers (~200 attendees, 3 days)
Co-organizer and facilitator
- 2014 Math on the "Planes" Annual Conference: Models for Fractions and rational numbers
Participants: K-16 math teachers and intervention teachers (~200 attendees, 3 days)
Co-organizer and facilitator
- 2013 Math on the "Planes" Summer bootcamp: Big ideas for number
Participants: K-16 math teachers and intervention teachers (~50 attendees, 5 days)
Co-organizer and facilitator

Websites for teachers

Realistic Mathematics Education: Units and activity sequences for secondary teachers

<http://RMEintheclassroom.com>

Resources for Teaching College Math

<http://www.fapeck.com/teachingcollegemath>

Resources for Teaching Math Through Problem Solving

<http://www.fapeck.com/problemsolving>

Resources for Broadening Access Through Detracking

<http://www.fapeck.com/detracking>