

Eve Manz

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EDUCATION

Ph.D., Mathematics and Science Education

Department of Teaching and Learning, Vanderbilt University, August, 2013.

Dissertation title: Integrating the conceptual, epistemic, and social aspects of scientific activity.

Committee members: Leona Schauble (co-chair), Richard Lehrer (co-chair), Rogers Hall, Doug Clark, Norbert Ross

Pennsylvania Teaching License

Kindergarten–6th Grade, Swarthmore College, Swarthmore, PA, 2002.

Bachelors Degree with Highest Honors

Major in Education and Psychology, Swarthmore College, 2001.

EMPLOYMENT

Assistant Professor

Science Education, Wheelock College of Education and Human Development, Boston University, Boston, MA. 2015-Present.

Assistant Professor

Curriculum and Instruction, School of Education, University of Colorado, Boulder, CO. 2013-2015.

Director of Curriculum

Developed curriculum and new programs focused on science and engineering, working with staff of four teachers and groups of up to 100 students. Eli Whitney Museum, Hamden, CT, 2007–2008.

Elementary School Teacher

Fourth Grade, Bonn International School, Bonn, Germany, 2005–2007.

Third Grade, Independence Charter School, Philadelphia, PA, 2003–2005.

Geography and Science, Independence Charter School, Philadelphia, PA, 2002–2003.

AWARDS

Early Career Research Award

Awarded by the National Association for Research in Science Teaching to an early career researcher who has made significant contributions to the field of Science Education, 2019.

Review of Research Award

For an outstanding review of research published in *Review of Educational Research* or *Review of Research in Education*; American Educational Research Association, 2016.

Best Paper

International Conference of the Learning Sciences, 2014

Early Career Workshop

International Conference of the Learning Sciences, 2014.

Otto Bassler Dissertation Award

Department of Learning, Teaching, and Diversity; Peabody College, Vanderbilt University, 2014

Sandra K. Abell Fellow

Selected to attend week-long training program for doctoral students in Science Education. Organized by the National Association for Research in Science Teaching, Summer, 2012.

Institute of Education Sciences Predoctoral Fellow

Competitive fellowship, five years graduate support, Vanderbilt University, 2008–2013.

Vanderbilt University Award

Vanderbilt University, 2008–2013.

Lang Achievement Award

Given to one Senior for outstanding academic achievement. Swarthmore College, 2001.

Solomon Asch Award

For the best senior thesis in psychology. Swarthmore College, 2001.

GRANTS AND RESEARCH PROJECTS

Principal Investigator. CAREER: Supporting Elementary Science Teaching and Learning by Integrating Uncertainty into Classroom Science Investigations. Early Career Award from the National Science Foundation to develop a conceptual framework, tools, and illustrative examples for supporting elementary school teachers to strategically engage students with uncertainty in empirical investigations. \$984,646. June, 2018-May, 2023.

Collaborator & Science Domain Lead. Great First Eight Kindergarten Curriculum Development. Nell Duke, PI. 2019-2022. Support the development of a comprehensive, project-based curriculum for kindergarten.

Co-Principal Investigator. Understanding How Elementary Teachers Take Up Discussion Practices to Promote Disciplinary Learning and Equity. PI, Lynsey Gibbons. Teachers as Learners grant awarded by the James S. McDonnell Foundation to study elementary teacher learning as teachers shift their

discourse practices within and across content areas. \$2,500,000. January, 2018-December, 2022.

Co-Principal Investigator. Interdisciplinary First Grade Project-Based Learning Planning Grant. Nell Duke, Principal Investigator. Awarded by the Lucas Educational Research Foundation to develop a curriculum framework for, and study the feasibility of, implementing a comprehensive project-based learning program in first grade classrooms. \$159,287; BU Subcontract \$24,863. January-July, 2016.

Co-Principal Investigator. Collaboratively Designing and Studying Innovative STEM Learning Ecologies. \$24,000 Outreach Grant awarded by the University of Colorado to Dr.'s Kris Gutiérrez and Eve Manz to study how preservice teachers make sense of the resources that traditionally marginalized youth bring to science, engineering, and technology activities in classroom and afterschool contexts. September, 2014-June, 2015.

Principal Investigator. Establishing Scientific Practices in Second Grade Classrooms. Funded by the partner school district and a competitive award from Women Investigating in the School of Education (WISE) for \$6,559. Developing, implementing, and studying professional development around scientific practices for second grade teachers in collaboration with the district science coordinator. September, 2014-June, 2015.

PUBLICATIONS IN PEER-REVIEWED JOURNALS

Hammer, D. and Manz, E. (2019). Odd ideas about learning science. *Science Education*, 103 (5), 1289-1293.

Manz, E. (2019). Getting a grip: A framework for designing and adapting elementary school science investigations. *Science and Children*, 56(8), 80-87.

Berland, L., Manz, E., Miller, E., & Stroupe, D. (2019). Working with and shifting the system. *Journal of Research in Science Teaching*, 56(4), 521-525.

Manz, E. and Suarez, E. (2018). Supporting teachers to negotiate uncertainty for science, students, and teaching. *Science Education*, 102(4), 771-795.

Miller, E., Manz, E., Russ, R., Stroupe, D., and Berland, L.K. (2018). Addressing the epistemic elephant in the room: Epistemic agency and the Next Generation Science Standards. *Journal of Research in Science Teaching*, 55(7), 1053-1075. (All authors contributed equally to this publication).

Manz, E., and Renga, I. (2017). Understanding how teachers guide evidence construction conversations. *Science Education* 101(4), 584-615.

Manz E. (2016). Examining evidence construction as the transformation of the material world into community knowledge. *Journal of Research in Science Teaching*, 53(7), 1113-1140.

Manz, E. (2015). Resistance and the development of scientific practice: Designing 'the Mangle' into science instruction. *Cognition and Instruction*, 33(2), 89-124.

Manz, E. (2015). Representing student argumentation as functionally emergent from scientific activity. *Review of Educational Research*, 85(4), 553-590. (Review of Research Award, 2016).

Manz, E. (2012). Understanding the co-development of modeling practice and ecological knowledge. *Science Education*, 96(6), 1071-1105.

PUBLICATIONS IN PEER-REVIEWED CONFERENCE PROCEEDINGS

Manz, E. (2018). Designing for and analyzing productive uncertainty in science investigations. In Kay, J. and Luckin, R. (Eds.) *Rethinking Learning in the Digital Age: Making the Learning Sciences Count, 13th International Conference of the Learning Sciences (ICLS) 2018*, (Volume 1, pp. 288-295). London, UK: International Society of the Learning Sciences.

Samarapungavan, A., Golan-Duncan, R., Chinn, C., Berland, L., Manz, E., Clase, K., Pelaez, N., Gardner, S., Misra, C. (2018). Unpacking dimensions of evidentiary knowledge and reasoning in the teaching and learning of science. In Kay, J. and Luckin, R. (Eds.) *Rethinking Learning in the Digital Age: Making the Learning Sciences Count, 13th International Conference of the Learning Sciences (ICLS) 2018*, (Volume). London, UK: International Society of the Learning Sciences.

Manz, E. (2014). 'Mangling' science instruction: Creating resistances to support the development of practices and content knowledge. In J. L. Polman, Kyza, E.A., O'Neill, D.K., Tabak, I., Penuel, W.R., Jurow, A.S., O'Connor, K., Lee, T., and D'Amico, L. (Ed.), *Learning and Becoming in Practice: The International Conference of the Learning Sciences (ICLS)* (Vol. 1, pp. 575-582). Boulder, CO: International Society of the Learning Sciences. (Best Paper Award)

BOOK CHAPTERS

Manz, E. & Allen, C. (2017). Supporting evidence construction practices in elementary classrooms. In D. Stroupe (Ed.), *Reframing science teaching and learning: Students and educators co-developing science practices in and out of school*. New York: Routledge.

PUBLICATIONS UNDER REVIEW

Manz, E. & Watkins, J. From uncertainty to sense-making: Understanding how classroom communities take up an individual's uncertainty and engage in collective scientific pursuits.

Manz, E., Lehrer, R., and Schauble, L. Rethinking the classroom science investigation.

PUBLICATIONS IN PREPARATION

Manz, E., Ward-Goldberg, A., and Wells, A. Tracing emergent science practices in science investigations (tentative title). Submission goal: *Cognition & Instruction*

Manz, E., Beckert, E., and Arnold, S. Redesigning classroom investigations to reframe uncertainty (tentative title). Submission goal: *Instructional Science*.

Manz, E., and Harel, U. Designing curriculum materials for district learning (tentative title). Submission goal: *Journal of Education*.

CONFERENCE PRESENTATIONS

Manz, E. Supporting evidence construction in elementary science investigations. (2019, April). In D. Morrison, S. Michaels, and J. Moon (Chairs), *Using Epistemic Tools to Support Reasoning, Student Agency, and Equity*. Symposium conducted at the annual meeting of the American Educational Research Association, Toronto, ON.

Schwarz, C., Manz, E., and Marcum, M. (2019, April). Modeling for sense-making in the elementary

classroom: Research, exemplars, and initial principles for modeling that works. In Pierson, A. (Chair), Supporting Modeling Epistemologies in the Classroom. Symposium conducted at the annual meeting of the American Educational Research Association, Toronto, ON.

Manz, E. (2018, June). “In real nature, does the wind blow three times?” Making the representational nature of evidence visible in classroom investigations. Paper presented in Ala Samarapungavan, Ravit Duncan, and Clark Chinn (co-chairs), Unpacking dimensions of evidentiary knowledge and reasoning in the teaching and learning of science, International Conference of the Learning Sciences, London, UK.

Manz, E. (2018, June). Designing for an analyzing productive uncertainty in science investigations. Paper presented at the International Conference of the Learning Sciences, London, UK.

Manz, E. (2018, March). Discussant. In K. McNeill (chair), Shifting elementary science classrooms to support science practices. Symposium conducted at the annual meeting of the National Association for Research in Science Teaching, Atlanta, GA.

Manz, E. and Wells, A. (2018, March). Incorporating productive uncertainty into empirical work in elementary classrooms. In S. Heredia, and E. Manz, (chairs), Exploring supports for teachers and students to engage with productive uncertainty in science investigations. Symposium conducted at the annual meeting of the National Association for Research in Science Teaching, Atlanta, GA.

Watkins, J. and Manz, E. (2018, March). Examining how classroom communities take up uncertainty for scientific sense-making. In Heredia, S. and Manz, E. (chairs), Exploring supports for teachers and students to engage with productive uncertainty in science investigations. Symposium conducted at the annual meeting of the National Association for Research in Science Teaching, Atlanta, GA.

Berland, L, Manz, E., Miller, E., Russ, R., and Stroupe D. (2017, April). Achieving epistemic justice by enabling epistemic agency. Symposium conducted at the annual meeting of the American Educational Research Association, San Antonio, TX.

Watkins, J and Manz, E. (2017, April). Characterizing how teachers respond to uncertainty to support scientific activity in classrooms. In J. Watkins (chair) Examining uncertainty as a construct for promoting meaningful scientific engagement. Symposium conducted at the annual meeting of the American Educational Research Association, San Antonio, TX.

Manz, E. (2017, April). Discussant. In A.M. Palincsar (chair) Integrating literacy and science to promote equitable opportunities in project-based learning: An interdisciplinary effort. Symposium conducted at the annual meeting of the American Educational Research Association, San Antonio, TX.

Manz, E. (2017, April). Uncertain about Uncertainty: Incorporating a Focus on the Reason for Science Practices into Work with Pre-Service and In-Service Teachers. Presentation at the Science Education at the Crossroads conference. San Antonio, TX.

Manz, E. and Suarez, E. (2016, April). Leveraging uncertainty to support students’ engagement in practice: A pilot study. In E. Manz (chair). Supporting students’ engagement in science and engineering practices: Exploring instructional shifts and supports for teachers. Symposium conducted at the annual meeting of the National Association for Research in Science Teaching, Baltimore, MD.

Manz, E. (2015, April). Talk strategies for addressing epistemic challenges in science teaching. In E.

- Manz (chair), Expanding frameworks for talk in science classrooms. Symposium conducted at the annual meeting of the American Educational Research Association, Chicago, IL.
- Manz, E. (2014, June). 'Mangling' science instruction: Creating resistances to support the development of practices and content knowledge. Presented at the 11th International Conference of the Learning Sciences, Boulder, CO.
- Manz, E. (2014, March). Unpacking the development of measurement practice. Paper presented at the Annual Meeting of the National Association for Research in Science Teaching, Pittsburgh, PA.
- Manz, E. (2013, April). The development of experimental practice: Tracing its social, epistemic, and conceptual dimensions. In R. Lehrer (chair), Designing to support the co-development of epistemic practices and knowledge in engineering, science, and mathematics. Symposium conducted at the annual meeting of the American Educational Research Association, San Francisco, CA.
- Manz E. (2012, April). Engaging students in the epistemic functions of scientific argumentation. In R. Lehrer (chair), Designing for and representing the development of epistemic practices in classroom communities. Symposium conducted at the annual meeting of the American Educational Research Association, Vancouver, BC.
- Manz E. (2012, March). Engaging students in developing the means of knowing through argument. In L. Berland (chair), Understanding the role of context and activity in students' argumentation practice. Related paper set conducted at the annual meeting of the National Association for Research in Science Teaching, Indianapolis, IN.
- Manz E. (2012, March). Understanding the co-development of modeling practice and ecological knowledge. Poster presented in the Sandra K. Abell Doctoral Student Research Institute Poster Session at the annual meeting of the National Association for Research in Science Teaching, Indianapolis, IN.
- Cotterman, M., Manz, E., Lehrer, R., Schauble, L., Lucas, D., and Shinohara, M. (2012, March). Engaging students in modeling to develop understanding of ecosystems. In C. Eberbach (chair), Learning about ecosystems: conceptualizing and designing learning environments. Related paper set conducted at the annual meeting of the National Association for Research in Science Teaching, Indianapolis, IN.
- Manz, E. (2011, June). Modeling to develop ecological explanations. Paper presented at the Jean Piaget Society Annual Conference, Berkeley, CA.
- Manz, E. (2011, June). Construction of ecological explanations: Understanding scientific reasoning in content-rich environments. Poster presented at the Jean Piaget Society Annual Conference, Berkeley, CA.
- Manz, E. and Pfaff, E. An Item Response Theory analysis of a linear measure assessment. (2010, June). Poster Presented at the Annual Conference of the Institute for Education Sciences, National Harbor, MD.
- Manz, E. (2010, March). Representational work in classrooms: Coordinating material redescription, amplification, and explanation. Poster paper presented at the annual conference of the National Association of Research in Science Teaching, Philadelphia, PA.

Manz, E., Lehrer, R., and Schauble S. (2010, March). Inscriptions in science classrooms: Negotiating the Material, Representational, and Explanatory. Poster paper presented at the annual conference of the American Educational Research Association, San Diego, CA.

INVITED PRESENTATIONS

Modeling in the early grades as a meaningful, productive practice. Invited presentation for the Modeling Synthesis Workshop, hosted by The Learning Partnership for Chicago Public Schools teachers and leaders.

Seeking and evaluating coherence: Some questions. Epistemic Heterogeneity Keynote Address, Waterbury Institute for the Learning Sciences, Penn State. May 14, 2019.

Engaging young students in scientific argumentation as transformation. In G. Newell, Chair, Teaching and Learning of Argumentation and Argumentative Reading and Writing in the Academic Disciplines, sponsored by the Writing and Literacies SIG at the annual conference of the American Educational Research Association, Toronto, April, 2019. (This is an invited symposium that I was asked to present in.)

Designing for productive uncertainty: A systems perspective. Invited Presentation to the Concord Consortium. March 27, 2019.

Designing for productive uncertainty: A systems perspective. Invited Presentation in the Boston University Center for Teaching and Learning 2018-2019 Learning Sciences Speaker Series. November 14, 2018.

CADRE Fellows Orientation Panel. Education Development Center, Waltham MA, November 2, 2018.

Supporting sense-making in elementary science teaching and learning: Approaches to implementing district science curriculum. Invited presentation at the annual meeting of the Massachusetts Science Education Leadership Association, Marlborough, MA. October 26, 2018.

Rethinking elementary school science investigations. Invited presentation at the Global Disruptors event hosted by the BU Innovate Center. April 17, 2018.

Designing the Mangle into science instruction, Invited presentation, Teaching and Learning Mathematics and Science, Middle Tennessee State University. October 25, 2017.

Supporting teachers to implement and manage productive uncertainty in elementary classrooms. Invited participant in the Spencer-funded Educative Video conference in November, 2016.

Preparing to teach STE in elementary schools: A discussion for stake-holders. Presentation at the MA STEM Summit, November 1, 2016, with Don DeRosa, Jeff Winokur, Kate McNeill, and Pam Pelletier.

Opening up science investigations to support participation in science practices. Invited presentation at the annual meeting of the Massachusetts Science Education Leadership Association, Marlborough, MA. October 20, 2016.

Opening up empirical investigations in the elementary classroom. Invited presentation in the CREATE for STEM Speaker Series, Michigan State University. March 24, 2016.

Methods for examining evidence construction. Invited presenter, Qualitative Methods, Michigan State University. March 24, 2016.

Revealing the patterns: The practice of analyzing and interpreting data. Invited Presentation for the Museum Institute of Teaching Science Professional Development Series, February 24, 2016.

Elementary teachers' enactment of scientific practices. Invited Speaker at the Annual Reception for Women Investing in the School of Education (WISE). University of Colorado Boulder. June 3, 2015.

Designing the mangle into science instruction. Invited guest, Epistemologies of Mathematics and Science, Vanderbilt University. April, 2015.

OTHER MEDIA

Productive uncertainty in elementary science. Podcast for NGSNavigators. Released March 7, 2019. <http://www.ngsnavigators.com/blog/021>

Designing 'productive uncertainty' into investigations to support meaningful engagement in science practices. STEM Teaching Tool Brief 60, <http://stemteachingtools.org/brief/60>

Making visible the struggles of research in design-based research (2 webinars), The Digital Media and Learning Research Hub, McArthur Foundation, May, 2015.

Twitter: @eveimanz

COURSES TAUGHT

ME 701: Theories of Learning and Epistemologies in Mathematics and Science Education. Doctoral-level course. Boston University Wheelock College

ED800: Theories of Learning, Teaching, and Equity. Introductory proseminar for doctoral students. Boston University Wheelock College

CH300-515: Methods of Instruction: Elementary 1-6 (Science Section). Boston University Wheelock College. Masters and undergraduate level course for prospective elementary teachers.

EDUC 8348: Purposes and Methods of Design-Based Research. University of Colorado Boulder.

EDUC 5215: Elementary Science Theory and Methods. University of Colorado Boulder.

DOCTORAL ADVISING AND MENTORING

Doctoral committee chair: Stephanie Mikelis

Dissertation committee member: Alessandra Ward-Goldberg, Victor Mateas, Meredith Baker (University of Michigan), Jen Radoff (Tufts University), Samuel Severance (University of Colorado Boulder), Enrique Suarez (University of Colorado Boulder), Bill Campbell (University of Colorado Boulder), Clarissa Keen (UMass Boston)

PROFESSIONAL ACTIVITIES AND SERVICE (UNIVERSITY)

Search Co-Chair, Lecturer in Elementary Science Education.
Boston University School of Education, Spring 2018.

Search Committee Member, Clinical Professor of Mathematics Education.
Boston University School of Education, Fall 2016.

Satellite Committee for Quantitative Reasoning; Boston University General Education.
Boston University, Fall 2016.

Strategic Committee on Doctoral Education.
Boston University, 2016-Present.

Research Committee

Boston University School of Education, Spring 2016

School of Education Representative to the Student Honor Code Committee
University of Colorado, Boulder 2013-2015.

PhD Student Association Co-Chair
Department of Teaching and Learning, Peabody College, Vanderbilt University, 2010.

PROFESSIONAL ACTIVITIES AND SERVICE (NATIONAL)

Editorial Board. Journal of Research in Science Teaching. 2016-2019.

Reviewer

NARST Annual Conference

AERA Annual Conference

Educational Researcher

Journal of the Learning Sciences

International Conference of the Learning Sciences

Cognition and Instruction

Learning and Instruction

Journal of Education

Science Education

NSF DRK-12 and EHR-Core programs panel reviewer

Professional Affiliations

National Association for Research in Science Teaching

American Educational Research Association

International Society for the Learning Sciences

PROFESSIONAL ACTIVITIES AND SERVICE (COMMUNITY & COMMUNICATION)

Thompson School Diversity and Inclusion Group. I serve on this parent-led group at my child's elementary school. This fall, I worked with team members to design, implement, and analyze a survey of parent and teacher experiences at the school.

Content Consultant. WGBH Broadcasting. I review scripts and learning goals for Molly of Denali, a WGBH-produced show. I provide feedback on the science content, appropriate standards targets, and means of supporting 3-8 year-olds to develop the target understandings. Spring, 2018-Present.

Consultant and PD Provider. Somerville Public Schools. Since December of 2016, I have supported Somerville district and school leaders to understand the MA State Science and Engineering/Technology Standards, to review curriculum materials, to develop a new framework for adapting and writing curriculum, to engage in curriculum adaptation, and to develop and implement a model for supporting teachers to use new curriculum materials to engage students in scientific sense-making.

Professional Development Provider, Springfield MA. I worked with the district science leadership in Springfield, MA to plan professional development for teachers focused on the new standards for science education (2016 MA Framework for Science and Engineering Technology). I consulted with the district science leadership and the Museum Institute for Teaching Science to plan district-wide PD and supported a small group of teachers in adapting their curriculum. Nov, 2016-May, 2017.

Professional Development Consultant and Provider, Westford, MA. I consulted with district leadership to plan PD for all K-2 teachers on how to adapt materials to engage students in science practices and align with the 2016 MA Frameworks for Science and Engineering/Technology. I delivered a three hour PD and worked with five second grade teachers to adapt and test a new set of materials for use in the rest of the district. Jan-June, 2017.