

Matthew J. Kloser

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107 Carole Sandner Hall
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EDUCATIONAL BACKGROUND

ORCID: 0000-0002-4902-9854

- 2011 – 2012 Post-Doctoral Scholar
Stanford University, Center to Support Excellence in Teaching
Pam Grossman, Advisor
- 2011 Ph.D., Science Education
Stanford University, Stanford, CA
- 2010 M.S., Biology
Stanford University, Stanford, CA
- 2004 M.Ed.
University of Notre Dame, Notre Dame, IN
- 2002 B.A., History and Pre-Professional (Pre-Medicine) Studies
University of Notre Dame, Notre Dame, IN

PROFESSIONAL APPOINTMENTS

- 2018 – Present Associate Professor of the Practice
Institute for Educational Initiatives, University of Notre Dame
- 2012 – Present Director, Notre Dame Center for STEM Education
Institute for Educational Initiatives, University of Notre Dame
- 2012 – 2018 Assistant Professor of the Practice
Institute for Educational Initiatives, University of Notre Dame
- 2004 – 2007 Assistant Program Director, ACE M.Ed.
Notre Dame, IN
- 2002 – 2007 High School Science and Mathematics Teacher
Birmingham, AL; South Bend, IN

RESEARCH PROJECTS & GRANTS

- 2022 – Present *Exploring the Relationship between Classroom Factors and Teacher Value-Added Measures in High School Biology Classrooms.*
PI
Notre Dame Faculty Research Initiation Grant \$5,500
- 2020 – Present *SPIRAL: Supporting Professional Inquiry and Re-Aligning Learning through a structured e-portfolio system.*
Co-PI
National Science Foundation (DRK-12), \$1,500,000
- 2019 – Present *Interruptions and Meaningful Multi-media Experiences Research in Science Education (IMMERSE)*
PI
Howard Hughes Medical Institute, \$124,000
- 2016 – Present *Investigating the Impact of Longitudinal Core Practice Professional Development on STEM Teaching Practice*
PI
Trustey Family/Sweeney Family Gifts, \$2,500,000 (Program & Research)
- 2015 – 2019 *Attention-Aware Cyberlearning to Detect and Combat Wandering Minds*
Advisory Board (Sydney D’Mello, PI)
National Science Foundation (CYBERLEARNING), \$565,000
- 2014 – 2018 *Measuring Next Generation Science Instruction Using Tablet-Based Teacher Portfolios*
Co-PI
National Science Foundation (REAL), \$1,800,000
- 2014 – 2017 *Improving Teachers’ Use of Data for Instructional Decisions: Using Assessment Portfolios for Professional Development*
PI
Spencer Foundation; \$300,000
- 2014 – 2017 *Investigating Core Teaching Practices Across Disciplines*
Research Faculty (Housed at Stanford)
Sponsor: Bill and Melinda Gates Family Foundation; \$400,000
- 2013 – 2016 *Investigating the Impact of an Organizational Change from a K-8 Catholic School to a STEM Academy*
PI
IEI (Notre Dame) Seed Grant; \$5,000

2010 – 2011 Impact of Text Type on High School Biology Learning
 PI
 Stanford Dissertation Support Grant; \$6,000

TEACHING & SUPERVISION

University Teaching Experience

2022 – Present Science and Social Studies in Elementary Education (EDU 60192)

2012 – Present Science Education Policy, Values, and Practices (ESS 30623)

2014 – Present Seminar in Educational Research, ESS Capstone (ESS 43640)

2006 – Present Science Methods I & II (EDU 60685/60785 - Graduate Level)
 Assessment in Science Education (EDU 60795 - Graduate Level)
 University of Notre Dame, Notre Dame, IN

2004 – 2007 Introduction to Teaching (EDU 60020 - Graduate Level)
 University of Notre Dame, Notre Dame, IN

Teaching Assistantships

2008 – 2009 Curriculum & Instruction in Science (EDUC 267B&C)
 STEP Program, Stanford University, Stanford, CA

2008 Communicating Science (GES 218)
 Stanford University, Stanford, CA

Mentoring and Supervision of Teaching

2011 – 2012 Beginning Teacher Support and Assessment (BTSA) Mentor
 Silicon Valley/Stanford University New Teacher Project

2007 – 2008 Field Supervisor for High School Science Teachers
 STEP Program, Stanford University, Stanford, CA

PUBLICATIONS

Refereed Journals

Kloser, M., Borko, H., Wilsey, M., & Rafanelli, S. (2022). Leveraging portfolios in professional development for middle school science teachers' assessment and data-use practice. *Science Education, 106*(4), 924-955.

- Martinez, J-F., Kloser, M., Srinivasan, J., Stecher, B., & Lavin, E. (2022). Developing situated measures of science instruction through an innovative electronic portfolio app for mobile devices: Reliability, validity, and feasibility. *Educational and Psychological Measurement*.
- Kloser, M., Martinez, J-F., Stecher, B., Edelman, A., Floyd, C., Srinivasan, J. (2020). Interrogating practice or ‘show-and-tell’?: Lessons learned from a digital-portfolio based PLC, *Journal of Science Teacher Education*. doi: [10.1080/1046560X.2020.1808267](https://doi.org/10.1080/1046560X.2020.1808267)
- Wilsey, M., Kloser, M., Borko, H., & Rafanelli, S. (2020). Influences of professional development on middle school science teachers’ mental models of assessment practice. *Educational Assessment*, 25(2), 136-158.
- Kloser, M., Wilsey, M., Madkins, T., & Windschitl, M., (2019). Connecting the dots: Linking frameworks for facilitating discussion to novice teacher practice. *Teaching and Teacher Education*, 80, 115-127.
- Kloser, M., Wilsey, M., Immonen, A., Navotas, A., & Twohy, K. (2018). “We do STEM”: Unsettled conceptions of STEM education in middle school STEM classrooms. *School Science and Mathematics*, 118(8), 335-347.
- Kloser, M., Wilsey, M., Hopkins, D., Dallavis, J. W., Lavin, E., & Comuniello, M. (2017). Dual identities: Organizational negotiation in STEM-focused Catholic schools. *Cultural Studies in Science Education*, 13, 549-579.
- Davis, E., Kloser, M., Windschitl, M., Wells, A., Carlson, J., & Marino, J-C. (2017). Teaching the practice of leading sense-making discussions in science: Using rehearsals, *Journal of Science Teacher Education*, 28(3), 275-293.
- Kloser, M., Borko, H., Martinez, F., Stecher, B., & Luskin, R. (2017). Evidence of middle school science assessment practice from classroom-based portfolios, *Science Education*, 101(2), 209-231.
- Kloser, M. (2016). Alternate text types and student outcomes: An experiment comparing traditional textbooks and more epistemologically considerate texts, *International Journal of Science Education*, 38(16), 2477-2499.
- Kloser, M. & Wilsey, M. (2015). No blue ribbon: Reforming science fairs in middle and high school science education, *The Science Teacher*, 82(8).
- Kloser, M. J. & Brownell, S. E. (2015). Toward a conceptual framework for measuring the effectiveness of course-based undergraduate research experiences in undergraduate biology. *Studies in Higher Education*, 1 – 20.
- Kloser, M. (2014). Identifying a core set of science teaching practices: A Delphi expert panel approach. *Journal of Research in Science Teaching*, 51(9), 1185 – 1217.

- Kloser, M. & Bofferding, L. (2014). Middle and high school students' conceptions of climate change mitigation and adaptation strategies. *Environmental Education Research*.
- Brownell, S., Kloser, M., Fukami, T., & Shavelson, R. (2013). Context matters: Volunteer bias, small sample size, and the value of comparison groups in the assessment of research-based undergraduate introductory biology lab courses. *Journal of Microbiology and Biology Education*, 14(2), 176 – 182.
- Kloser, M. (2013). Exploring high school biology students' engagement with more and less epistemologically considerate texts. *Journal of Research in Science Teaching*, 50(10), 1232 – 1257.
- Kloser, M., Brownell, S., Fukami, T., & Shavelson, R. (2013). Effects of a research-based ecology lab course: A study of non-volunteer achievement, self-confidence and perception of lab course purpose. *Journal of College Science Teaching*, 42(3), 72 – 81.
- Kloser, M. (2012). A place for the nature of biology in biology education. *Electronic Journal of Science Education*, 16(2), 1-21.
- Martinez, J. F., Borko, H., Stecher, B., Luskin, R., & Kloser, M. (2012). Measuring quality assessment in science classrooms through artifacts and self-report. *Educational Assessment*, 17(2-3), 107-131.
- Kloser, M. & Brownell, S., Shavelson, R., & Fukami, T. (2012). *Journal of College Science Teaching*. Undergraduate biology lab courses: Comparing the impact of traditionally-based 'cookbook' and authentic research-based courses on student lab experiences, 41(4), 36-45.
- Kloser, M., Brownell, S., Chiariello, N., & Fukami, T. (15 November 2011). *PLOS Community Pages*. Integrating teaching and research in undergraduate biology laboratory education, 9(11).
- Brown, B. & Kloser, M. (2009). Conceptual continuity and accessing everyday scientific understandings. *Cultural Studies in Science Education*, 4, 875-897.
- Brown, B. & Kloser, M. (2009) A view of the tip of the iceberg: revisiting conceptual continuities and their implications for science teaching. *Cultural Studies in Science Education*, 4, 921-928.

Books, Book Chapters, and Invited Reports

- Kloser, M. & Windschitl, M. (2020). Comparing pedagogies in two secondary methods courses. In *Preparing science teachers through practice-based teacher education*, D. Stroupe, K. Hammerness, S. McDonald (Eds.). Cambridge, MA: Harvard Education Press.

- Kloser, M. & Windschitl, M., (2019). Scaffolds, tools, and disciplined improvisation. In *Sensemaking in Elementary Science*, E. Davis, C. Zembal-Saul, S. M. Kademian (Eds.). New York, NY: Routledge.
- Kloser, M. (2018). *The nature of the teacher's role in supporting student investigations in middle and high school science classrooms: Creating and participating in a community of practice*. A report commissioned by the National Academies of Sciences, Engineering, and Medicine. Washington D.C.
- Kloser, M. and Troy, S. (2018). *Reading nature: Engaging biology students with evidence from the living world*. Arlington, VA: NSTA Press.
- Kelly-Peterson, M., Davis, Ghouseni, H., Kloser, M., and Monte-Sano, C. (2018). Rehearsals as approximations of practice. In P. Grossman and M. Franke (Eds), *Teaching core practices in teacher education*. Cambridge, MA: Harvard Education Press.
- Rafanelli, S., Borko, H., Kloser, M., Wilsey, M. (2018). From focusing on grades to exploring student thinking: A case study of change in assessment practice. In Fives, H. and Barnes, N. (Eds) *Data use*. London: Routledge.
- Brown, B., Henderson, B., & Kloser, M. (2012). Bridging cultures: The role of culturally-relevant pedagogy, discursive identity, and conceptual continuities in the promotion of scientific literacy. In Moore, J. L. III and Lewis, C. W. (Eds.) *Urban school contexts for African American students: Crisis and prospects for improvement*. New York: Peter Lang Publishers.
- Kloser, M. (2007). From Warsaw to Birmingham: The making of a teacher. In J. Watzke (Ed.), *Beyond Alternative Education*. Notre Dame, Indiana: ACE Press.

PRESENTATIONS/PROCEEDINGS

- Kloser, M., Szopiak, M., Wagner, C. (2023). Experimentally Comparing Student Interest in, Engagement in, and Comprehension of Expository and Narrative Biology Videos. *A Paper for the National Association of Research in Science Teaching*. Chicago, IL.
- Wagner, C., Kloser, M., Szopiak, M. (2023). High School Students' Images of Science: A Decade into NGSS. *A Roundtable for the National Association of Research in Science Teaching*. Chicago, IL.
- Oz., E., Kloser, M., Wagner, C., Ostdiek, L., Bullinger, S., Malkani, A. (2023). Qualitative Cases of Science Teaching Practice: Comparing Instruction Based on Value-Added Ratings. *A Paper for the Annual Meeting of the National Association of Research in Science Teaching*. Chicago, IL.
- Kloser, M., Martinez, J-F, Szopiak, M., Saint Martin Guerr, M., Kovach, J., Betzleberger, J., Hyughn, R., John, L-K., Ong, C. (2023). SPIRAL Project: Initial Findings of Vertical,

Cross-Grade Professional Learning Community Discussions of Science Teaching Practice. *A Paper for the Annual Meeting of the American Educational Research Association*. Chicago, IL.

- Oz., E., Kloser, M., Wagner, C., Ostdiek, L., Bullinger, S., Malkani, A. (2023). Exploring Science Teacher Value-Added Measures and Instructional Quality. *A Paper for the Annual Meeting of the American Educational Research Association*. Chicago, IL.
- Oz., E. and Kloser, M. (2022). Middle school students' understanding of and interest in STEM-related careers. *A Paper for the Annual Meeting of the American Educational Research Association*. San Diego, CA.
- Kloser, M., Szopiak, M., Wagner, C. (2022). Effects of pedagogical interruptions on secondary student interest, engagement, and comprehension of narrative science videos. *A Paper for the National Association of Research in Science Teaching*. Vancouver, Canada.
- Kloser, M. (2021). Applying an equity framework to STEM Contexts. *A Presentation for the Making STEM a Force for Good: Excellence in Teaching Conference*. Virtual Conference.
- Kloser, M., Szopiak, M., & Wagner, C. (2021). A storied discipline: Exploring a place for narrative in science education. *A Paper for the National Association of Research in Science Teaching*. Virtual Conference.
- Oz, E. and Kloser, M. (2021). Motivational factors mediating attitudes toward STEM careers amongst a national sample of middle school students. *A Paper for the National Association of Research in Science Teaching*. Virtual Conference.
- Oz, E. and Kloser, M. (2021). Middle school students' motivational dispositions and STEM career attitudes. *A Paper for the Annual Meeting of the American Educational Research Association*. Virtual Conference.
- Doan, S. Kaufman, J.H., Kloser, M.J., Schweig, J.D., & Tekkumru-Kisa, M. (2021). What do science teachers know about three-dimensional science standards and why does it matter? *A Paper for the Annual Meeting of the American Educational Research Association*. Virtual Conference.
- Kloser, M., Wilsey, M., Oz, E. (2020). Middle Grade STEM Teachers' Conceptions and Prioritization of Core Instructional Practices Over Time. *A Paper for the Annual Meeting of the National Association of Research in Science Teaching*. Orlando, FL. [Cancelled due to COVID-19]
- Silla, E., & Hornburg, C. B., Kloser, M., & McNeil, N. M. (2020). Research-based teaching practices for improving students' understanding of mathematical equivalence have not made it into elementary classrooms. In S. Denison, M. Mack, Y. Xu, & B. C. Armstrong (Eds.), *Proceedings of the 42nd Annual Conference of the Cognitive Science Society*. Austin, TX: Cognitive Science Society.

- Wilsey, M. and Kloser, M. (2020). Changes in middle school S.T.E.M. teachers' drawn mental models of STEM education over time. *A Paper for the Annual Meeting of the National Association of Research in Science Teaching*. Orlando, FL. [Cancelled due to COVID-19]
- Kloser, M., Martinez, J-F., Stecher, B., Edelman, A., Floyd, C., Srinivasan, J. (2019). Interrogating practice or 'show-and-tell'? : Lessons learned from a digital-portfolio based PLC. *A Paper for the Annual Meeting of the National Association of Research in Science Teaching*. Baltimore, MD.
- Kloser, M., Borko, H., Wilsey, M., & Rafanelli, S. (2018). Leveraging portfolios in professional development for middle school science teachers' assessment and data-use practice. *A Paper for the Annual Meeting of the American Educational Research Association*. New York, NY.
- Kloser, M., Wilsey, M., Madkins, T., Windschitl, M., Wells, A., Carlson, J., & Davis, B. (2018). Connecting the dots: Secondary science teacher candidates' uptake of facilitating discussions from teacher education experiences. *A Paper for the Annual Meeting of the National Association of Research in Science Teaching*. Atlanta, GA.
- Martinez, J. F., Stecher, B., & Kloser, M. (2018). Measuring instruction using classroom artifacts and portfolios: Evidence from four recent studies. *A Symposium for Annual Meeting of the National Council on Measurement in Education*. New York, NY.
- Rafanelli, S., Borko, H., Kloser, M., & Wilsey, M. (2018). Science teachers' changing assessment practices: Case studies of individual change through PD and professional collaboration. *A Paper for the Annual Meeting of the National Association of Research in Science Teaching*. Atlanta, GA.
- Rafanelli, S., Borko, H., Kloser, M., & Wilsey, M. (2017). From focusing on grades to exploring student thinking: A case study of change in assessment practice. *A Paper for the Annual Meeting of the American Educational Research Association*. San Antonio, TX.
- Kloser, M., Gottlieb, J., Wilsey, M., Svarovsky, G. N., Kirkland, P., & Puricelli, J. (2017). Exploring the relationship among middle grade teacher's conceptions of STEM and equity. *A Paper for the Annual Meeting of the National Association of Research on Science Teaching*. San Antonio, TX.
- Martinez, F., Riedell, K., Rocchio, R., Srinivasan, J., Kloser, M., Wilsey, M., & Stecher, B. (2016). Next generation tablet e-portfolio tool for documenting and reflecting on instructional practice: Possibilities for teacher evaluation and development. *A Paper for the Annual Meeting of the European Association for Research on Learning and Instruction*. Oslo, Norway.
- Kloser, M., Borko, H., Wilsey, M., & Rafanelli, S. (2016). Science teachers' use of data for instructional decisions: Mental models of middle school science assessment practice. *A*

Paper for the Annual Meeting of the National Association of Research for Science Teaching. Baltimore, MD.

- Kloser, M., Wilsey, M., Hopkins, D., Dallavis, J., Lavin, E., & Comuniello, M. (2016). Dual identities: Toward a framework for STEM-focused Catholic schools. *A Paper for the Annual Meeting of the National Association of Research for Science Teaching.* Baltimore, MD.
- Davis, B., Kloser, M., Windschitl, M., Wells, A., & Carlson, J. (2016). Teaching the practice of leading sensemaking discussions in science: Using rehearsals. *A Paper for the Annual Meeting of the American Education Research Association.* Washington DC.
- Martinez, J. F., Kloser, M., Srinivasan, J., Riedell, K., Stecher, B., Rocchio, R., Wilsey, M., & Tangmunarunkit, H. (2016). A tablet-based teacher e-portfolio tool for documenting and reflecting on next generation science instruction. *A Paper for the Annual Meeting of the American Education Research Association.* Washington DC.
- Kloser, M., Borko, H., Martinez J. F., Stecher, B., & Luskin, R. (2014). Portraits of assessments: The intended and enacted assessments in middle school science classrooms. *A Paper for the Annual Meeting of the National Association of Research for Science Teaching.* Pittsburgh, PA.
- Core Practice Consortium. (2014). Enriching research and innovation through the specification of professional practice: The Core Practice Consortium. Presidential Session. *A Paper for the Annual Meeting of the American Educational Research Association.* Philadelphia, PA.
- Kloser, M. (2013). A Different Common Core: An Expert Delphi Study on Core Science Teaching Practices. *A Paper for the Annual Meeting of the National Association of Research for Science Teaching.* Puerto Rico.
- Kloser, M. & Bofferding, L. (2013). Middle and High School Students' Responses to Climate Change: The Conflation of Mitigation and Adaptation. *A Paper for the Annual Meeting of the National Association of Research for Science Teaching.* Puerto Rico.
- Kloser, M. (2013). A Different Common Core: An Expert Delphi Study on Core Science Teaching Practices. *A Paper for the Annual Meeting of the American Educational Research Association.* San Francisco, CA.
- Kloser, M. & Bofferding, L. (2013). Middle and High School Students' Responses to Climate Change: The Conflation of Mitigation and Adaptation. *A Paper for the Annual Meeting of the American Educational Research Association.* San Francisco, CA.
- Martinez, J. F., Borko, H., Stecher, B., Luskin, R., & Kloser, M. (2013). Measuring the Classroom Environment through Student Surveys: Methodological, Conceptual and Policy Issues. *A Paper for the Annual Meeting of the American Educational Research Association.* San Francisco, CA.

- Kloser, M. (2012). Formative assessment in science and math classrooms. *Invited Presenter for the Notre Dame Forum on K-20 STEM Education.*
- Kloser, M. (2012). Performance assessments and science education. *Invited Presenter for the Spring Knowles Science Teaching Fellows Meeting.* Los Angeles, CA.
- Kloser, M. (2012). Comparative interactions of high school biology students engaging textbook accounts and narratives of historical experiments. *A Paper for the Annual Meeting of the National Association of Research for Science Teaching.* Indianapolis, IN.
- Martinez, J. F., Borko, H., Stecher, B., Luskin, R., & Kloser, M. (2011). Measuring quality assessment in science classrooms through artifacts and self-report. *A Paper for the Annual Meeting of the American Educational Research Association.* New Orleans, LA.
- Kloser, M. & Brownell, S. (2011). Comparing outcomes of traditional ‘cookbook’ versus single-question, open-ended undergraduate biology labs. *A Poster Presentation for the Annual Meeting of the National Association for Research in Science Teaching.* Orlando, FL.
- Kloser, M. (2010). The unique nature of biology and its implications for biology education. *A Paper for the Annual Meeting of the National Association for Research in Science Teaching.* Philadelphia, PA.
- Kloser, M. (2010). I earned an “A” in Spanish, but got lost in Spain: Why performance assessments matter for student learning. *A Presentation for the Annual GEOTech Conference.* Dallas, TX.
- Kloser, M. (2009). Teaching evolution. *A Presentation for the Annual Meeting of the National Catholic Education Association.* Anaheim, CA.

CONSULTING & ADVISORY BOARDS

- 2018 – Present Advisory Board, *Intelligent diagnostic assessment platform for high school statistics.* (IES Grant – Cheng, Y., PI)
- 2017 – Present Advisory Board, *Exploring differences between instructors’ exams and how these differences produce scores that could inaccurately and inequitably represent student understanding.* (NSF Grant – Brownell, S., PI)
- 2017 – Present Project S.I.M.P.L.E. Consultant
- 2017 Pew Research Survey Consultant on STEM Education
- 2015 – 2017 Advisory Board, *Illuminating the black box: Using consensus in student survey reports as an indicator of instructional microclimates in mathematics and science.* (NSF Grant – Schweig, J., PI)

SERVICE AND AWARDS

Service

2020 – Present	JRST Editorial Board
2012 – 2020	NARST Strand 1 & 4 Conference Proposal Reviewer
2016 – 2017	Department of Biological Sciences Introductory Biology Redesign Committee
2016 – 2017	Intellectual Virtues Planning Committee (Templeton Grant)
2012 – 2016	Indiana STEM Education Advisory Board
2014 – 2016	Orthoworx Education Council Board Member
2012 – 2015	Committee Member, NARST Early Career in Research Award
2010 – 2011	Committee Member, Stanford School of Education Dean Search Committee Stanford Office of the Provost

Ad Hoc Journal/Grant Reviewer

Action in Teacher Education

AERJ

Cultural Studies in Science Education

Education Evaluation and Policy Analysis

Educational Researcher

International Journal of Science Education

Journal of Research in Science Teaching (Editorial Board)

National Science Foundation

Science Education

Spencer Foundation

Conference Proposal Reviewer

AERA 2011 – Present

JRST 2011 - Present

Awards

2015	JRST Outstanding Paper Award National Association for Research in Science Teaching
2014	‘Research Worth Reading’ Selection National Association of Research in Science Teaching

- 2011 NARST Outstanding Dissertation Research Award Finalist
National Association for Research in Science Teaching
- 2011 NARST Conference Outstanding Paper Award
National Association for Research in Science Teaching
- 2010 Gerald J. Lieberman Fellowship
- 2004 Master of Education Commencement Speaker
University of Notre Dame
- 2004 Theodore Ryken Award for Teaching and Service
Holy Family High School, Birmingham, AL
- 2002 Summa cum Laude
University of Notre Dame
- 2002 Phi Alpha Theta, History Honor Society
University of Notre Dame
- 1998 – 2002 Lilly Scholar
University of Notre Dame

PROFESSIONAL ORGANIZATIONS

- 2009 – Present National Association for Research in Science Teaching
- 2008 – Present American Educational Research Association
- 2012 – 2020 National Science Teachers Association
- 2005 – 2006 Association for Supervision and Curriculum Development