

## KATHERINE L. McNEILL

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Boston College  
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### EDUCATION

#### **University of Michigan, Ann Arbor MI**

Ph.D., Science Education 2006

Dissertation title: *Supporting students' construction of scientific explanations through curricular scaffolds and teacher instructional practices*

Committee Members: Joseph Krajcik (chair), Elizabeth Davis, Brian Reiser, Priti Shah

M.S., Ecology and Evolutionary Biology 2005

M.S., Science Education 2005

**Brown University, Providence RI** 1998

B.A., Biology & B.A., English and American Literature (Honors)

### RESEARCH EXPERIENCE

#### **Supporting Scientific Argumentation Project**

Boston College, Chestnut Hill, MA

*Principal Investigator* 2008 - present

- Research teacher and student beliefs, ideas and abilities for scientific argumentation. Design and investigate instructional environments to support scientific argumentation and assessments to measure beliefs and knowledge of argumentation. Supported in part by Carnegie grant B 8780, NSF grant DRL-0836099, and a Boston College Research Incentive Grant.

#### **Urban Ecology Research and Learning Group**

Boston College, Chestnut Hill, MA

*Principal Investigator* 2006 - 2011

- Collaboratively develop and research with the Urban Ecology Institute (UEI) curriculum materials, instructional strategies, and professional development experiences for grade 5-12 students and their teachers focused on scientific inquiry and urban ecology. Supported in part by NSF grants DRL-0607010 and DRL-0639466.

#### **The Center for Highly Interactive Classrooms, Curricula, & Computing in Education (hi-ce)**

University of Michigan, Ann Arbor, MI

*Graduate Student Research Assistant* 2001 - 2006

- Collaboratively developed, piloted, and researched a learning-goals-driven design model and curriculum for middle school science. Research focused on how curricular scaffolds and teacher instructional practices support students in learning scientific inquiry and science concepts.

### TEACHING EXPERIENCE

#### **Boston College, Chestnut Hill, MA**

*Assistant Professor* 2006 - present

- Teach ED300: Secondary and Middle School Science Methods for undergraduate and masters level students. Teach elementary science methods, ED109: Teaching about the Natural World, for

undergraduate students. Teach ED 737: Contemporary Issues in Curriculum and Instruction – An Introduction to the Learning Sciences for doctoral students.

**University of Michigan, Ann Arbor, MI**

*Instructor*

2005

- Co-taught secondary science methods, Education 422: Teaching of Science in the Secondary Schools, for undergraduate and masters level students.

**University of Michigan, Ann Arbor, MI**

*Teaching Assistant*

2005 & 2006

- Taught computer laboratory sessions for Education 890: Multilevel Analysis of Survey Data, which focused on hierarchical linear modeling (HLM) and the use of HLM 6.01 software.

**The Ellis School, Pittsburgh, PA**

*6<sup>th</sup> and 7<sup>th</sup> Grade Science Teacher*

1998 –2001

- Taught 7<sup>th</sup> grade Life Science and 6<sup>th</sup> grade Physical Science. Designed and rewrote Life Science curriculum to integrate inquiry practices and the use of technology.

**Center for Talented Youth, The Johns Hopkins University**

*Instructor*

Summers 1998 - 2001

- Designed and taught course for high school students (*Fast-Paced High School Biology*) and middle school students (*Science and Engineering; Dynamic Earth Processes*).

**Center for Talented Youth, The Johns Hopkins University**

*Laboratory Assistant*

Summers 1996 - 1997

- Co-taught Meteorology course for middle school students. Taught all laboratory investigations.

**Providence Science Outreach, Brown University & Providence Public Schools**

*Student Teacher and Group Leader*

1996 - 1998

- Instructed fifth grade classes in weekly science lessons and coordinated Brown undergraduates.

## REFEREED JOURNAL ARTICLES

Berland, L. K. & McNeill, K. L. (in press). For whom is argument and explanation a necessary distinction? A response to Osborne and Patterson. *Science Education*.

Hashimoto-Martell, E. A., McNeill, K. L., & Hoffman, E. M. (in press). Connecting urban youth with their environment: The impact of an urban ecology course on student content knowledge, environmental awareness and responsible behaviors. *Research in Science Education*.

McNeill, K. L. & Houle, M. E. (in press). Urban high school students' critical science agency: Conceptual understandings and environmental actions around climate change. *Research in Science Education*.

McNeill, K. L., Pimentel, D. S., & Strauss, E. G. (in press). The impact of high school science teachers' beliefs, curricular enactments, and experience on student learning during an inquiry-based urban ecology curriculum. *International Journal of Science Education*.

Price, J. F., Pimentel, D.S., McNeill, K.L., Strauss, E. G., & Barnett, M. (2011). Science in the 21<sup>st</sup> century: More than just the facts. *The Science Teacher*, 78(7), 36-41.

McNeill, K. L. (2011). Elementary students' views of explanation, argumentation and evidence and abilities to construct arguments over the school year. *Journal of Research in Science Teaching*, 48(7), 793-823.

McNeill, K. L. & Martin, D. M. (2011). Claims, evidence and reasoning: Demystifying data during a unit on simple machines. *Science and Children*. 48(8), 52-56.

- Fogleman, J., McNeill, K. L., & Krajcik, J. (2011). Examining the effect of teachers' adaptations of a middle school science inquiry-oriented curriculum unit on student learning. *Journal of Research in Science Teaching*, 48(2), 149-169.
- Berland, L. K. & McNeill, K. L. (2010). A learning progression for scientific argumentation: Understanding student work and designing supportive instructional contexts. *Science Education*, 94(5), 765-793.
- McNeill, K. L. & Pimentel, D. S. (2010). Scientific discourse in three urban classrooms: The role of the teacher in engaging high school students in argumentation. *Science Education*, 94(2), 203-229.
- McNeill, K. L. & Krajcik, J. (2009). Synergy between teacher practices and curricular scaffolds to support students in using domain specific and domain general knowledge in writing arguments to explain phenomena. *The Journal of the Learning Sciences*, 18(3), 416-460.
- McNeill, K. L. (2009). Teachers' use of curriculum to support students in writing scientific arguments to explain phenomena. *Science Education*, 93(2), 233-268.
- Novak, A. M., McNeill, K. L., & Krajcik, J. (2009). Helping students write scientific explanations. *Science Scope*, 33(1), 54-56.
- McNeill, K. L. & Krajcik, J. (2008). Scientific explanations: Characterizing and evaluating the effects of teachers' instructional practices on student learning. *Journal of Research in Science Teaching*, 45(1), 53-78.
- Hug, B. & McNeill, K. L. (2008). First and second hand experiences in science: Does data type influence classroom conversations? *International Journal of Science Education*, 30(13), 1725-1751.
- Krajcik, J., McNeill, K. L. & Reiser, B. (2008). Learning-goals-driven design model: Curriculum materials that align with national standards and incorporate project-based pedagogy. *Science Education*, 92(1), 1-32.
- McNeill, K. L., Lizotte, D. J., Krajcik, J., & Marx, R. W. (2006). Supporting students' construction of scientific explanations by fading scaffolds in instructional materials. *The Journal of the Learning Sciences*, 15(2), 153-191.

## BOOK CHAPTERS

- McNeill, K. L. & Krajcik, J. (2008). Assessing middle school students' content knowledge and reasoning through written scientific explanations. In Coffey, J., Douglas, R., & Stearns, C. (Eds.), *Assessing Science Learning: Perspectives from Research and Practice*. (pp. 101-116). Arlington, VA: National Science Teachers Association Press.
- McNeill, K. L. & Krajcik, J. (2008). Inquiry and scientific explanations: Helping students use evidence and reasoning. In Luft, J., Bell, R. & Gess-Newsome, J. (Eds.). *Science as inquiry in the secondary setting*. (p. 121-134). Arlington, VA: National Science Teachers Association Press.
- Krajcik, J., Slotta, J., McNeill, K. L. & Reiser, B (2008). Designing learning environments to support students constructing coherent understandings. In Kali, Y., Linn, M. C., & Roseman, J. E. (Eds.) *Designing coherent science education: Implications for curriculum, instruction, and policy*. (pp.39-64). New York, NY: Teacher College Press.
- McNeill, K. L. & Krajcik, J. (2007). Middle school students' use of appropriate and inappropriate evidence in writing scientific explanations. In Lovett, M & Shah, P (Eds.), *Thinking with data*. (pp. 233-265). New York, NY: Taylor & Francis Group, LLC.
- Harris, C. J., McNeill, K. L., Lizotte, D. L., Marx, R. W. & Krajcik, J. (2006). Usable assessments for teaching science content and inquiry standards. In McMahan, M., Simmons, P., Sommers, R.,

DeBaets, D., & Crowley, F. (Eds.), *Assessment in science: Practical experiences and education research* (pp. 67-88). Arlington, VA: National Science Teachers Association Press.

Sutherland, L., M. McNeill, K. L., Krajcik, J. & Colson, K. (2006). Supporting students in developing scientific explanations. In Douglas, R., Klentschy, M. P., Worth, K., & Binder, W. (Eds.), *Linking science and literacy in the K-8 classroom*. (pp. 163-181). Arlington, VA: National Science Teachers Association Press.

## BOOKS

Zemal-Saul, C., McNeill, K. L., & Hershberger, K. (in press). *What's your evidence? Engaging k-5 students in constructing explanations in science*. New York, NY: Pearson Allyn & Bacon.

Zemal-Saul, C., McNeill, K. L., & Hershberger, K. (in press). *Book study facilitator's guide: What's your evidence? Engaging k-5 students in constructing explanations in science*. New York, NY: Pearson Allyn & Bacon.

McNeill, K. L. & Krajcik, J. (2012). *Supporting grade 5-8 students in constructing explanations in science: The claim, evidence and reasoning framework for talk and writing*. New York, NY: Pearson Allyn & Bacon.

McNeill, K.L. & Krajcik, J. (2012). *Book study facilitator's guide: Supporting grade 5-8 students in constructing explanations in science: The claim, evidence and reasoning framework for talk and writing*. New York, NY: Pearson Allyn & Bacon.

## OTHER PAPERS

Price, J. F. & McNeill, K. L. (revise and resubmit). Searching for a lived science curriculum in intersecting figured worlds: An exploration of meaning in science education. *Journal of Research in Science Teaching*.

Pimentel, D. S. & McNeill, K. L. (in review). Conducting talk in science classrooms: Investigating instructional moves and teacher beliefs. *Science Education*.

McNeill, K. L. & Knight, A. M. (in preparation). Teachers' pedagogical content knowledge of scientific argumentation: The impact of professional development on teaching k-12 science.

McNeill, K. L. & Proctor, C. P. (in preparation). Literacy and science versus science literacy: Integrating the domains to support 21<sup>st</sup> century learning goals.

Knight, A. M. & McNeill, K. L. (in preparation). Scientific argumentation: Teachers' pedagogical content knowledge, belief and classroom practice.

## CURRICULUM MATERIALS

Strauss, E.G., McNeill, K. L., Barnett, M., & Reece, F. (2011). *Urban EcoLab: How do we develop healthy and sustainable cities?* Chestnut Hill, MA: Boston College. Available at: <http://urbanecolabcurriculum.com/>

McNeill, K. L., Harris, C. J., Heitzman, M., Lizotte, D. J., Sutherland, L. M., & Krajcik, J. (2004). How can I make new stuff from old stuff? In J. Krajcik & B. J. Reiser (Eds.), *IQWST: Investigating and questioning our world through science and technology*. Ann Arbor, MI: University of Michigan.

## GRANTS

**Co-Principal Investigator. *Constructing and Critiquing Arguments in Middle School Science Classrooms: Supporting Teachers with Multimedia Educative Curriculum Materials*. \$623,803**

subcontract from University of California Berkeley (total \$3,147,015). National Science Foundation – DRL-1119584. September 2011 – August 2016. The project includes the design and research of how multimedia educative curricular materials (MECMs), within the context of a year-long Earth and Space Science curriculum, can support middle school science teachers in effectively integrating argumentation into their classroom practice. PI: Dr. Suzanna Loper, Lawrence Hall of Science. Other Co-Principal Investigator: Jacqueline Barber, Lawrence Hall of Science.

**Senior Personnel. *Constructing and Critiquing Arguments: Diagnostic Assessment for Information and Action System.*** \$197,694 subcontract from University of California Berkeley (total \$1,281,900). Carnegie Corporation of NY – B 8780, July 2011 – June 2014. This project focuses on creating generalizable frameworks, knowledge, and tools to build a rich assessment system to support middle school students in constructing and critiquing oral and written arguments in science. PIs: Jacqueline Barber, Lawrence Hall of Science and Dr. P. David Pearson, University of California Berkeley.

**Co-Principal Investigator. *Science Educators for Urban Schools,*** \$749,980 National Science Foundation – DUE-0833278, September 2008 – August 2013. This grant focuses on the preparation, support and retention of individuals who received an undergraduate degree in the sciences to earn a masters in science education and then teach science in urban schools. PI: Dr. Audrey Friedman, Boston College. Other Co-Principal Investigators: Dr. Vidya Madhavan, Boston College.

**Principal Investigator. *Supporting Grade 5-8 Students in Writing Scientific Explanations,*** \$198,578 National Science Foundation – DRL-0836099, August 2008 – July 2011. This grant included the development of a book and a research study to investigate the impact of that book and accompanying professional development on teachers' beliefs and classroom practices to support grade 5-8 students in constructing scientific explanations.

**Co-Principal Investigator. *Urban Ecology Course Materials Created with a Universal Design for Learning Framework,*** \$2,093,000 National Science Foundation – DRL-0607010, September 2006 – August 2011. This project focused on the development and study of an urban ecology curriculum that engages youth in science by providing a locally relevant, field-based course for urban high school students. PI: Dr. Eric Strauss, Boston College. Other Co-Principal Investigators: Dr. Michael Barnett, Boston College, Mr. Charles Lord, Urban Ecology Institute and Dr. Tracey Hall, Center for Applied Special Technologies.

**Principal Investigator. *Supporting Urban Elementary Students in Scientific Argumentation,*** \$15,000 Boston College Research Incentive Grant, June 2008 – May 2009. This research study examined urban elementary students' abilities to engage in scientific argumentation in both talk and writing, investigated how students with diverse backgrounds navigate between everyday and scientific discourses, and developed instructional strategies to support students in this scientific practice.

**Co-Principal Investigator. *Development Of An Integrated Pathway For Urban Stem Teaching and Learning In Grades 5-8,*** \$799,860 National Science Foundation – DRL-0639466, January 2007 – December 2010. This grant focused on the development of urban ecology curriculum materials that are sequenced to improve students learning of ecological concepts from grade five through eight in the out-of-school time (OST) environment. PI: Dr. Michael Barnett, Boston College. Other Co-Principal Investigators: Dr. Eric Strauss, Boston College, Mr. Charles Lord, Urban Ecology Institute.

**Co-Principal Investigator. *Enhancing Science Experiences for minority students through technology-enhanced field-studies,*** \$68,000, Hewlett-Packard - 1896660, Spring 2007 – Spring 2008. This grant provided resources and funding to engage university students, in-service teachers, and high school student in learning how to use tablet PCs and GIS technology. PI: Dr. Michael Barnett, Boston College. Other Co-Principal Investigators: Dr. Eric Strauss, Boston College, Dr. Alan Kafka, Boston College.

**AWARDS AND HONORS**

NARST Early Career Research Award	2011
<ul style="list-style-type: none"> <li>The National Association for Research in Science Teaching (NARST) gives the award annually to the early researcher who demonstrates the greatest potential to make outstanding and continuing contributions to research in science education.</li> </ul>	
Boston College Teaching with New Media Award, Magna Cum Laude	2010
Featured <i>JRST</i> research article in <i>The Science Teacher</i> and <i>Science Scope</i>	2009
Early Career Research Associate, Center for Curriculum Materials in Science	2006 – 2007
Graduate Fellow, Center for Curriculum Materials in Science	2002 – 2006
University of Michigan Rackham One-term Dissertation Fellowship	2006
University of Michigan School of Education Fellowship	2001 –2004

**CONFERENCE PAPERS AND PRESENTATIONS**

McNeill, K. L., Corrigan, S., Barber, J., Goss, M., & Knight, A. M. (2012, March). *Designing student assessments for understanding, constructing and critiquing arguments in science*. Poster to be presented at the annual meeting of the National Association for Research in Science Teaching, Indianapolis, IN.

Pimentel, D. S. & McNeill, K. L. (2012, March). *Secondary science teacher beliefs about talk during whole-class discussions*. Paper to be presented at the annual meeting of the National Association for Research in Science Teaching, Indianapolis, IN.

Knight, A. M. & McNeill, K. L. (2012, March). *Comparing students' written and verbal scientific arguments*. Paper to be presented at the annual meeting of the National Association for Research in Science Teaching, Indianapolis, IN.

Berland, L. K. & McNeill, K. L. (2012, March) *For whom is argument and explanation a necessary distinction?* Paper to be presented at the annual meeting of the National Association for Research in Science Teaching, Indianapolis, IN.

McNeill, K. L. & Knight, A. M. (2011, April). *The effect of professional development on teachers' beliefs and pedagogical content knowledge for scientific argumentation*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Orlando, FL.

Knight, A.M., & McNeill, K. L. (2011, April). *The relationship between teachers' pedagogical content knowledge and beliefs of scientific argumentation on classroom practice*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Orlando, FL.

DeLisi, J., McNeill, K. L., & Minner, D. (2011, April). *Illuminating the relationship between inquiry science instruction and student learning: Results from three case studies*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Orlando, FL.

Price, J. F. & McNeill, K. L. (2011, April). *Negotiating meaning across communities in the science curriculum*. Paper presented at the annual meeting of the American Educational Research Association, New Orleans, LA.

McNeill, K. L. & Knight, A. M. (2010, June). *Teachers' pedagogical content knowledge of students' science writing and talk*. Poster presented at the International Conference of the Learning Sciences (ICLS), Chicago, IL.

McNeill, K. L., Pimentel, D. S., & Strauss, E. G. (2010, June). *The effect of teachers' beliefs and curricular enactments on student learning in high school science*. Poster presented at the International Conference of the Learning Sciences (ICLS), Chicago, IL.

Hashimoto-Martell, E. A., McNeill, K. L., & Hoffman, E. M. (2010, May). *The impact of an urban ecology course on students' scientific learning, environmental awareness and stewardship*. Paper presented at the annual meeting of the American Educational Research Association, Denver, CO.

McNeill, K. L. (2010, March). *Explanation, argument and evidence in science, science class and the everyday lives of fifth grade students*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Philadelphia, PA.

Pimentel, D. S. & McNeill, K. L. (2010, March). *Discourse in science classrooms: The relationship between teacher perceptions and their practice*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Philadelphia, PA.

Houle, M. E., Nolasco, M., & McNeill, K. L. (2010, March). *Investigating the influence of teachers' orientations toward curriculum materials on enactment*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Philadelphia, PA.

Berland, L. K. & McNeill, K. L. (2009, June). *Learning progression to inform scientific argumentation in talk and writing*. Paper presented at the Learning Progression in Science conference, Iowa City, IA.

Price, J. F. & McNeill, K. L. (2009, June). *Web 2.0 supporting dialogic and hermeneutic activities in science curriculum*. Paper presented at the annual meeting of the National Educational Computing conference, Washington, DC.

Pimentel, D. S. & McNeill, K. L. (2009, May). *Teacher discourse and science talk*. Paper presented at the annual meeting of the New England Educational Research Organization, Portsmouth, NH.

Price, J. F. & McNeill, K. L. (2009, May). *Reflecting on the urban ecology curriculum: Engaging students and teachers in dialogue and hermeneutics with technology*. Paper presented at annual meeting of the New England Educational Research Organization, Portsmouth, NH.

McNeill, K.L. & Pimentel, D. S. (2009, April). *Scientific discourse in urban classrooms: The role of the teacher in engaging students in argumentation*. Paper presented at the annual meeting of the American Educational Research Association, San Diego, CA.

Piazza, P., McNeill, K. L., & Hittinger, J. (2009, April). *Developing a voluntary teacher community: The role of professional development, collaborative learning and conflict*. Paper presented at the annual meeting of the American Educational Research Association, San Diego, CA.

Krajcik, J. & McNeill, K. L. (2009, April). *Designing instructional materials to support students in writing scientific explanations: Using evidence and reasoning across the middle school years*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Garden Grove, CA.

McNeill, K. L. (2009, March). *A learning progression to support students in justifying their claims with evidence and reasoning*. Presentation at the annual meeting of the National Science Teachers Association, New Orleans, LA.

McNeill, K. L. & Pimentel, D. S. (2008, April). *High school students' use of evidence in argumentation talk in an urban ecology unit*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Baltimore, MD.

Gatling, A., McNeill, K. L., Martin, D. & Barnett, M. (2008, April). *Comparison of field and university based science methods courses impact on preservice teachers' views of how students learn*

*science*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Baltimore, MD.

McNeill, K. L. (2007, April). *The role of the teacher in supporting students in writing scientific explanations*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, New Orleans, LA.

McNeill, K.L. & Krajcik, J. (2007, April). *Relationship between teacher instructional practices and curricular scaffolds in supporting students in writing scientific explanations*. Paper presented at the annual meeting of the American Educational Research Association, Chicago, IL.

McNeill, K. L. & Kuhn, L. (2006, April). *Sequencing and supporting complex scientific inquiry practices in instructional materials for middle school students: Explanation and argumentation*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, San Francisco, CA.

Krajcik, J. & McNeill, K. L. (2006, April). *Designing middle school science curriculum materials to foster students' developing deep understanding of key learning goals*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, San Francisco, CA.

McNeill, K. L. & Krajcik, J. (2006, April). *Supporting students' construction of scientific explanation through generic versus context-specific written scaffolds*. Paper presented at the annual meeting of the American Educational Research Association, San Francisco, CA.

Krajcik, J., McNeill, K. L. & Reiser, B. (2006, April). *A learning goals driven design model for developing science curriculum*. Paper presented at the annual meeting of the American Educational Research Association, San Francisco, CA.

Parkinson, J., Spybrook, J. & McNeill, K. L. (2006, April). *Investigating the context of small classes in kindergarten and its effects on teachers and students*. Paper presented at the annual meeting of the American Educational Research Association, San Francisco, CA.

Krajcik, J. & McNeill, K. L. (2006, February). *Supporting secondary students in scientific practices: Using evidence, creating models and constructing explanations*. Paper presented at To Think and Act Like A Scientist: The Roles of Inquiry, Research, and Technology, Lubbock, TX.

McNeill, K. L., Lizotte, D. J., & Krajcik, J. (2005, April). *Identifying teacher practices that support students' explanations in science*. Paper presented at the annual meeting of the American Educational Research Association, Montreal, Canada.

Fogleman, J. & McNeill, K. L. (2005, April). *Comparing teachers' adaptations of an inquiry-oriented chemistry unit*. Paper presented at the annual meeting of the American Educational Research Association, Montreal, Canada.

Hug, B. & McNeill, K. L. (2005, April). *Students' discussions of data: Affordances and constraints of first and second hand experiences*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Dallas, TX.

McNeill, K. L. & Krajcik, J. (2004, June). *Middle school students' use of evidence and reasoning in writing scientific explanations*. Paper presented at the 33rd Carnegie Symposium on Cognition, Pittsburgh, PA.

McNeill, K. L., Lizotte, D. J., Krajcik, J., & Marx, R. W. (2004, April). *Supporting students' construction of scientific explanations using scaffolded curriculum materials and assessments*. Paper presented at the annual meeting of the American Educational Research Association, San Diego, CA.

Lizotte, D. J., McNeill, K. L., & Krajcik, J. (2004, June). *Teacher practices that support students' construction of scientific explanations in middle school classrooms*. Paper presented at the International Conference of the Learning Sciences (ICLS), Santa Monica, CA.

McNeill, K. L., Lizotte, D. J., Harris, C. J., Scott, L. A., Krajcik, J., & Marx, R. W. (2003, March). *Using backward design to create standards-based middle-school inquiry-oriented chemistry curriculum and assessment materials*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Philadelphia, PA.

Lizotte, D. J., Harris, C. J., McNeill, K. L., Marx, R. W., & Krajcik, J. (2003, April). *Usable assessments aligned with curriculum materials: Measuring explanation as a scientific way of knowing*. Paper presented at the annual meeting of the American Educational Research Association, Chicago, IL.

## INVITED PRESENTATIONS

McNeill, K. L. (December, 2010). *Supporting meaning making in science: The role of scientific inquiry, argumentation and the use of evidence in science learning*. Cary Institute of Ecosystem Studies, Millbrook, NY.

McNeill, K. L. (October, 2010). *Promoting scientific practices: Developing learning environments to support students in constructing arguments to explain phenomena*. Syracuse University, Syracuse, NY.

McNeill, K. L. (February, 2010). *Explanation and argumentation: Supporting claims with evidence and reasoning*. Worcester Polytechnic Institute, Worcester, MA.

McNeill, K. L. (August, 2009). *Performance expectations: What counts as student "understanding" in science?* The Massachusetts Board of Education Science and Technology/Engineering Review Panel Meeting. Marlboro, MA.

McNeill, K. L. (June, 2009). *Science writing: Supporting students in justifying claims with evidence and reasoning*. Boston Public Schools Leadership Conference: Building Schools of Excellence. University of Massachusetts Boston, Boston, MA.

McNeill, K. L. (May, 2009). *Supporting students in using evidence and reasoning in scientific explanations and arguments*. STEM Education Institute at the University of Massachusetts Amherst, MA.

McNeill, K. L. & Martin, D. (May, 2009). *Supporting students in science thinking and writing: Justifying claims with evidence and reasoning*. Boston Public Schools Science Instructional Team Retreat. Babson College, Wellesley, MA.

McNeill, K. L. (April, 2008). *Designing middle school science learning environments*. Rutgers University, New Brunswick, NJ.

McNeill, K. L. (March, 2008). *Supporting students in scientific explanation and argumentation*. International Conference of Professional Development and Student Learning for Innovative Science Curricula. National Taiwan Normal University, Taipei, Taiwan.

McNeill, K. L. (June, 2007). *Scientific explanations: Supporting middle school students' use of evidence and reasoning in writing explanations in science*. TERC, Cambridge, MA.

McNeill, K. L., Kuhn, L., Krajcik, J., & Reiser, B. (February, 2006). *Learning progressions for scaffolding student participation in scientific explanation and argumentation*. National Science Foundation, K-12 Math, Science, and Technology Curriculum Developers Conference, Arlington, VA.

**WORKSHOPS**

McNeill, K. L. & Pelletier, P. (2012, March). *Supporting claim, evidence and reasoning (CER) across grades and curricula*. Workshop to be presented at the annual meeting of the National Science Teachers Association. Indianapolis, IN.

McNeill, K. L. & Krajcik, J. (2012, March). *Claim, evidence, and reasoning: Next steps after introducing the framework*. Workshop to be presented at the annual meeting of the National Science Teachers Association. Indianapolis, IN.

McNeill, K. L., Knight, A. M., & Price, J. F. (2011, November). *Reasoning in science using the CER framework*. Workshop presented to the Waltham Public Schools, Waltham, MA.

Duncan, R. G., Krajcik, J., Fortus, D., McNeill, K. L., & Plummer, J. (2011, April). *Developing and assessing learning progressions in science*. Workshop presented at the annual meeting of the National Association for Research in Science Teaching. Orlando, FL.

McNeill, K.L. & Martin, D. M. (2011, March). *Supporting elementary students in science writing using claims, evidence and reasoning*. Workshop presented at the annual national meeting of the National Science Teachers Association. San Francisco, CA.

McNeill, K.L. & Krajcik, J. (2011, March). *Claim, evidence and reasoning: Supporting middle school students in evidence-based scientific explanations*. Workshop presented at the annual national meeting of the National Science Teachers Association. San Francisco, CA.

McNeill, K.L. & Krajcik, J. (2011, March). *Supporting grades 5-8 students in constructing explanations in science: The claim, evidence, and reasoning framework for talk and writing*. Workshop presented at the annual national meeting of the National Science Teachers Association. San Francisco, CA.

McNeill, K. L. & Knight, A. M. (2011, January - May). *Course 2: Supporting k-12 students with claims, evidence and reasoning in science*. Workshop series presented to Boston Public School teachers, Boston, MA.

McNeill, K. L. & Knight, A. M. (2011, January - March). *Course 1: Supporting k-8 students with claims, evidence and reasoning in science*. Workshop series presented to Boston Public School teachers, Boston, MA.

McNeill, K. L. & Knight, A. M. (2010, October - 2011, April). *Supporting students in science thinking and writing*. Workshop series presented at Oakhill Middle School, Newton, MA

McNeill, K. L. & Martin, D.M. (2010, March). *Demystifying data through claims, evidence and reasoning: Bridging the gap between elementary science and literacy*. Workshop presented at the National Science Teachers Association Research Dissemination Conference on Keeping Elementary Science Primary. Philadelphia, PA.

McNeill, K. L. & Martin, D. M. (2010, March). *Strengthening science writing and inquiry: Helping students develop claims with evidence and reasoning*. Workshop presented at the annual national meeting of the National Science Teachers Association. Philadelphia, PA.

McNeill, K. L. & Krajcik, J. (2010, March). *Teaching strategies to support middle school students in constructing evidence-based scientific explanations*. Workshop presented at the annual national meeting of the National Science Teachers Association. Philadelphia, PA.

McNeill, K. L. (2010, February). *Middle school students and science writing: Supporting claims with evidence and reasoning*. Workshop presented at Brown Middle School, Newton, MA.

- McNeill, K. L. & Knight, A. M. (2010, January - March). *Supporting elementary students in science thinking and writing: Justifying claims with evidence and reasoning in science*. Workshop series presented to Boston Public School teachers, Boston, MA.
- McNeill, K. L. & Knight, A. M. (2009, December – 2010, February). *Supporting high school students in science thinking and writing: Justifying claims with evidence and reasoning in science*. Workshop series presented to Boston Public School teachers, Boston, MA.
- McNeill, K. L. & Knight, A. M. (2009, September - December). *Supporting middle school students in science thinking and writing: Justifying claims with evidence and reasoning in science*. Workshop series presented to Boston Public School teachers, Boston, MA.
- McNeill, K. L. (2009, September). *Supporting middle school students in writing arguments across the content areas*. Workshop presented at the Rafael Hernandez Two-Way Bilingual School, Boston, MA.
- McNeill, K. L. & Krajcik, J. (2009, March). *Supporting and assessing English language learners in writing scientific explanations*. Workshop presented at the National Science Teachers Association Conference on Science Assessment, Literacy and the English Language Learner. New Orleans, LA.
- McNeill, K. L. (2008, December). *Strategies to support high school students in writing scientific explanations*. Workshop presented at the Dorchester Education Complex, Boston, MA.
- McNeill, K. L. (2008, August). *Assessing students' content knowledge and scientific reasoning through written explanations*. Workshop presented at the Geneticist-Educator Network of Alliances (GENA) summer workshop, Montclair, NJ.
- McNeill, K. L. (2008, August). *Supporting students in science writing: Writing arguments that include claims justified with evidence and reasoning*. Workshop presented at the Rafael Hernandez Two-Way Bilingual School, Boston, MA.
- McNeill, K. L. & Krajcik, J. (2008, July). *Assessing students' content knowledge and scientific reasoning through written explanations*. Workshop presented at the Geneticist-Educator Network of Alliances (GENA) summer workshop, Washington, DC.
- Krajcik, J., McNeill, K. L., & Novak, A. (2008, March). *Assessing middle school students' content knowledge and scientific reasoning through written explanations*. Workshop presented at the National Science Teachers Association Conference on Science Assessment, Boston, MA.
- Krajcik, J. & McNeill, K. L. (2008, March). *Designing learning progressions in science education*. Workshop presented at National Taiwan Normal University, Taipei, Taiwan.
- McNeill, K. L. & Krajcik, J. (2007, August). *Assessing students' content knowledge and scientific reasoning through written explanations*. Workshop presented at the Geneticist-Educator Network of Alliances (GENA) summer workshop, Bethesda, MD.
- Krajcik, J. & McNeill, K. L. (2007, March). *Assessing middle school students' content knowledge and scientific reasoning through written explanations*. Workshop presented at the National Science Teachers Association Conference on Science Assessment, St. Louis, MO.
- Krajcik, J. & McNeill, K. L. (2006, April). *Assessing middle school students' content knowledge and scientific reasoning through written explanations*. Workshop presented at the National Science Teachers Association Conference on Science Assessment, Anaheim, CA.
- Krajcik, J. & McNeill, K. L. (2005, November). *Assessing middle school students' content knowledge and scientific reasoning through written explanations*. Workshop presented at the National Science Teachers Association Conference on Science Assessment, Chicago, IL.

Sutherland, L.M., McNeill, K.L., Krajcik, J. & Colson, K. (2005, April). *Supporting students in creating scientific explanations*. Workshop presented at the National Science Teachers Association Conference on Linking Science and Literacy in the Classroom, Dallas, TX.

Sutherland, L.M., McNeill, K.L., & Colson, K. (2004, November). *Supporting students in creating scientific explanations*. Workshop presented at the National Science Teachers Association Conference on Linking Science and Literacy in the Classroom, Seattle, WA.

## MEMBERSHIPS

National Association for Research in Science Teaching, since 2002

American Educational Research Association, since 2002

International Society of the Learning Sciences, since 2003

National Science Teachers Association, since 2006

## PROFESSIONAL SERVICES

Associate Editor for the *Journal of Research in Science Teaching (JRST)*, 2011 to present.

Member of the National Association for Research in Science Teaching (NARST) committee for the best journal article published in the *Journal of Research in Science Teaching (JRST)*, 2009 to present.

Primary reviewer for the *Next Generation Science Standards(NGSS)*, 2011 to present.

Member of the NGSS Lead State Advisory Group for Massachusetts, 2011 to present.

Member of the panel to revise the Massachusetts Science and Technology/Engineering Curriculum Framework, 2009 to present.

Member of the National Association for Research in Science Teaching (NARST) publications committee, 2008 to 2009.

Review science assessment items for content validity for the Massachusetts Test for Education Licensure (MTEL), 2008.

### Review Journal Articles

- *Journal of Research in Science Teaching*, 2005 to present
- *International Journal of Research in Science Teaching*, 2006 to present
- *Journal of the Learning Sciences*, 2006 to present
- *Science Education*, 2006 to present
- *The Elementary School Journal*, 2008 to present
- *Science*, 2010 to present
- *Research in Science Education*, 2010 to present

### Review Grant Proposals

- Review National Science Foundation (NSF) grant proposals. 2008
- Review Israel Science Foundation (ISF) grant proposals. 2007, 2009 & 2011.

### Review Conference Proposals

- Annual Meeting for the National Association for Research in Science Teaching, 2002 to present
- Annual Meeting for the American Educational Research Association, 2003 to present
- International Conference for the Learning Sciences, 2003 to present

Member of the National Science Teachers Association Awards Subcommittee, 2002 & 2003

## Advisory Boards

- Member of the advisory board for a Bill and Melinda Gates Foundation grant awarded to Lawrence Hall of Science entitled – Promoting equitable and accessible science instruction: Extending the *Seeds of Science/Roots of Reading* curriculum to middle school, 2010-2014.
- Member of the advisory board for a NSF ITEST grant awarded to Education Development Center, Inc. (EDC) entitled - Promoting STEM career interests in the classroom: An exploratory study linking teacher professional development with changes in teaching practice, 2008-2011.

**CONSULTING**

- |   |                |
|---|----------------|
| Australian Academy of Science   | 2010 - present |
| <ul style="list-style-type: none"> <li>• Advised Australian Academy of Science on the implementation of argumentation strategies for k-6 students into nine <i>Primary Connections: Linking science with literacy</i> curriculum units.</li> </ul>              |                |
| Lawrence Hall of Science, University of California, Berkeley  | 2009           |
| <ul style="list-style-type: none"> <li>• Provided feedback on the integration and support of elementary students in constructing scientific explanations in an NSF funded curriculum <i>Seeds of Science/Roots of Reading</i>.</li> </ul>                       |                |
| American Society of Human Genetics (ASHG)   | 2007 - 2008    |
| <ul style="list-style-type: none"> <li>• Advised ASHG on teacher professional development workshops as part of their NSF funded project, The Geneticist-Educator Network of Alliances (GENA).</li> </ul>  |                |
| Educational Testing Service (ETS)   | 2008           |
| <ul style="list-style-type: none"> <li>• Reviewed a policy report for the NAEP 8<sup>th</sup> grade data to identify teacher characteristics and instructional strategies related to student science achievement using hierarchical linear modeling.</li> </ul> |                |
| WGBH Educational Foundation   | 2007           |
| <ul style="list-style-type: none"> <li>• Advised WGBH on the development of a children's television series focused on environmental sustainability.</li> </ul>  |                |
| Merck Institute of Science Education (MISE)   | 2007           |
| <ul style="list-style-type: none"> <li>• Reviewed pedagogical content knowledge tools for middle school science teachers around the topics of populations, communities and food chains.</li> </ul>  |                |
| Institute of Computer Technology and Intel® Innovation in Education   | 2004           |
| <ul style="list-style-type: none"> <li>• Advised the design of software to support middle and high school students in the construction of arguments. Designed materials for professional development workshops with teachers.</li> </ul>                        |                |

**SERVICE TO THE UNIVERSITY**

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|--|----------------|
| Doctoral Advisory Committee  | 2010 – present |
| <ul style="list-style-type: none"> <li>• Member of the doctoral advisory committee for the TESECI department.</li> </ul>   |                |
| School of Education Technology Committee   | 2007 – present |
| <ul style="list-style-type: none"> <li>• Member of the School of Education Technology Committee.</li> </ul>  |                |
| Commencement Faculty Marshal   | 2007 - 2010    |
| Earth, Space and Environmental Science Program (ES)2P Committee  | 2009 – 2010    |
| <ul style="list-style-type: none"> <li>• Member of the university wide advisory committee to develop a new science program across several departments, schools, institutes and centers at Boston College.</li> </ul> |                |

- Center for Catholic Education 2006 – 2010
- Served as a science curriculum consultant for St. Columbkille, Worcester Catholic elementary schools and Providence Catholic middle schools. Provided professional development workshops for teachers around science standards, scientific inquiry, and using science curriculum.
- Undergraduate Advisory Committee 2007 - 2010
- Member of the undergraduate advisory committee for the TESECI department.
- School of Education Nominating Committee 2008 – 2010
- Member of the School of Education Nominating Committee.
- Teacher Education Accreditation Council (TEAC) Committee 2007 - 2009
- Member of a subcommittee to synthesize evidence for the TEAC accreditation inquiry brief.
- Teachers for a New Era, Collaboration with Arts and Sciences Faculty 2006 – 2008
- Served as the science education point person for collaboration with A&S science faculty.

### **ADVISEES AND STUDENTS' COMMITTEES**

#### Doctoral Advisees

Rebecca Katsh Singer, Amanda Knight, Erin Hashimoto-Martell, Jeremy Price, Diane Silva Pimentel

#### Active Dissertation Committees for Doctoral Students

Jeremy Price (chair), Diane Silva Pimentel (chair), Isaac Li, Rebecca Lewis, Gabrielle Stanco, Shelagh Peoples

#### Completed Dissertation Committees

Ismail Marulcu (2010), Anne Gatling (2010), Meredith Houle (2008)