

Benjamin R. Lowell

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EDUCATION

Boston College , Chestnut Hill, MA	2022
PhD in Curriculum & Instruction: Science Education	
Dissertation Committee: Katherine L. McNeill (chair), Marilyn Cochran-Smith, Laura O'Dwyer, Brian J. Reiser	
Stanford University , Stanford, CA	2011
MA in Education, Teaching of Biology	
Brown University , Providence, RI	2010
ScB with Honors in Biochemistry, <i>magna cum laude</i>	

ACADEMIC & PROFESSIONAL APPOINTMENTS

New York University , New York, NY	2023-present
Clinical Assistant Professor of Science Education	
NYC Residency Director, Science Content Mentor in NYU Teacher Residency	
Boston College , Chestnut Hill, MA	2017-2023
Postdoctoral Research Fellow	2022-2023
Graduate Student Research Assistant	2017-2022
Graduate Student Teaching Fellow	2020-2021
Neighborhood House Charter School , Boston, MA	2021-2023
Instructional Coach	
Fremont High School , Sunnyvale, CA	2011-2017
Science Teacher (full time)	2012-2017
Science Teacher (60% time)	2011-2012
Science Department Chair	2015-2017
Cooperating teacher for student teachers	2014-2017
Monta Vista High School , Cupertino, CA	2011-2012
Science Teacher (40% time)	

UNIVERSITY TEACHING EXPERIENCE

New York University

EMAT-GE 2009: What Do I Teach? 2023
Instructor, Fall 2023

Methods course for graduate pre-service secondary teachers focused on unit-level curriculum planning and development. Taught as part of the NYU Teacher Residency

EMAT-GE 2013: How Do I Teach Science? 2023
Instructor, Fall 2023

Methods course for graduate pre-service secondary science teachers focused on lesson planning. Taught as part of the NYU Teacher Residency

Boston College

EDUC 6300: Secondary/Middle School Science Methods 2021
Instructor, Spring 2021

Methods course for undergraduate and graduate pre-service secondary and middle school science teachers. Focused on teaching science as a process of figuring out the natural world.

EDUC 2109: Teaching About the Natural World 2018-2021
Instructor, Spring 2021, Spring 2020; Co-instructor, Spring 2019; Teaching Assistant, Fall 2018

Science methods course for undergraduate pre-service elementary teachers. Focuses on teaching science-as-practice and includes implementation of science lessons in an after-school program at a local elementary school (pre-2020 only).

REFEREED JOURNAL ARTICLES

Lowell, B.R. & McNeill, K.L. (2022). Changes in teachers' beliefs: A longitudinal study of science teachers engaging in storyline curriculum-based professional development. *Journal of Research in Science Teaching*. Advance online publication. <https://doi.org/10.1002/tea.21839>.

Lowell, B.R. & McGowan, H. (2022). Using key features to analyze and modify curriculum for the NGSS. *Science Scope*, 45(3), 48-54.

Lowell, B.R., Cherbow, K., & McNeill, K.L. (2022). Considering discussion types to support collective sensemaking during a storyline unit. *Journal of Research in Science Teaching*, 59(2), 195-222. <https://doi.org/10.1002/tea.21725>.

Winner of 2023 NSTA/NARST Research Worth Reading Award

McNeill, K.L., Lowenhaupt, R., Cherbow, K., & **Lowell, B.R.** (2022). Professional development to support principals' vision of science instruction: Building from their prior experiences to support the science practices. *Journal of Research in Science Teaching*, 59(1), 3-29. <https://doi.org/10.1002/tea.21719>.

Lowell, B.R., Cherbow, K., & McNeill, K.L. (2021). Re-design or re-label? How a commercial curriculum and its implementation oversimplify key features of the NGSS. *Science Education*, 105(1), 5-32. <https://doi.org/10.1002/sce.21604>.

Lowell, B.R. & McNeill, K.L. (2019). Keeping critical thinking afloat: Shifting from activity-based to phenomenon-based planning and instruction. *Science Scope*, 43(1), 64-69.

Cherbow, K., McNeill, K.L., Lowenhaupt, R., McKinley, M.T., & **Lowell, B.R.** (2019). NGSS lesson adaptations: A resource for integrating the science practices into your instruction. *Science and Children*, 56(5), 73-77.

BOOKS

Lowenhaupt, R., McNeill, K.L., Katsh-Singer, R.; **Lowell, B.R.**, & Cherbow, K. (2022). *The instructional leader's guide to implementing K-8 science practices*. ASCD Press.

REFEREED CONFERENCE PROCEEDINGS

Lowell, B.R. & McNeill, K.L. (2020, June 20-23). *Using student hat to push on multiple goals in teacher professional learning* [Paper presentation]. International Conference of the Learning Sciences, presented asynchronously. <https://repository.isls.org//handle/1/6522>.

OTHER WORK IN PROGRESS

Lowell, B.R., Fogelman, S.E., & McNeill, K.L. (in review). Organizational sensemaking during curriculum implementation: The dilemma of agency, role of collaboration, and importance of discipline-specific leadership.

Cherbow, K., **Lowell, B.R.**, Affolter R., Gymonpre, K., & McNeill, K.L. (minor revisions). Eliciting initial ideas, building understandings, and coming to consensus: Using different teacher moves to support three distinct discussion types.

Lowell, B.R. (major revisions). The student hat in curriculum-based professional development: Building epistemic empathy to support teacher learning. *Science Education*

McNeill, K.L., Affolter, R., **Lowell, B.R.**, Cherbow, K., Gonzalez, C, & Lee, S. (in review). Supporting teachers through curriculum-based professional learning: Shifting teachers' vision of science instruction to empower student voice.

INVITED TALKS

Lowenhaupt, R. & **Lowell, B.R.** (2022, November 3). Tools for science supervision and coaching: Instructional Leadership for the Science Practices. Invited virtual presentation to the Colorado District Science Leaders Meeting.

Lowell, B.R. (2020, November 19). Considering key features of the NGSS to support curriculum implementation. Invited virtual presentation to the Michigan Math and Science Leadership Network.

RESEARCH PRESENTATIONS

Lowell, B.R., Affolter, R., McNeill, K.L., & Fine, C.G. (2023, April 18-21). *The role of professional learning and enactment experience in teaching storyline curricula: Nationwide Survey Results* [Paper presentation]. NARST 96th Annual International Conference, Chicago, IL.

McNeill, K.L., Fine, C.G., **Lowell, B.R.**, & Affolter, R. (2023, April 18-21). *Teachers' descriptions and rationale of customizations of storyline curriculum: Adapting for their classroom contexts*. [Paper presentation]. NARST 96th Annual International Conference, Chicago, IL.

Cherbow, K., McNeill, K.L., & **Lowell, B.R.** (2023, April 18-21). *Enacting curriculum that are coherent from the student perspective: Exploring the teacher-storyline relationship*. [Paper presentation]. NARST 96th Annual International Conference, Chicago, IL.

Lowell, B.R. & McNeill, K.L. (2022, March 27-30). *Changes in teachers' beliefs and confidence across multiple rounds of professional development* [Paper presentation]. NARST 95th Annual International Conference, Vancouver, Canada.

Lowell, B.R., Cherbow, K. & McNeill, K.L. (2021, April, 7-10). *Using a discussion types framework to support collective sensemaking* [Paper presentation]. NARST 94th Annual International Conference, presented virtually.

McNeill, K.L., Affolter, R., **Lowell, B.R.**, Gonzalez, C. & Cherbow, K. (2021, April 7-10). *Curriculum-based professional development to support teachers' vision of recent shifts in science instruction* [Paper presentation]. NARST 94th Annual International Conference, presented virtually.

Lowell, B.R., Cherbow, K., McNeill, K.L., Affolter, R. & Gonzalez, C. (2020, April 17-21). *What's the point of this talk?: Enactment of multiple discussion types to support epistemic agency* [Roundtable paper presentation]. American Educational Research Association Annual Meeting, San Francisco, CA. (Conference canceled).

McNeill, K.L., Affolter, R., **Lowell, B.R.**, Gonzalez, C. & Cherbow, K. (2020, March 15-18). *Supporting Teachers' Vision of Science Instruction through Professional Development for Reform-Based Curriculum Materials* [Paper presentation]. NARST 93rd Annual International Conference, Portland, OR. (Conference canceled).

Lowell, B.R., Cherbow, K. & McNeill, K.L. (2019, March 31-April 3). *Assessing curriculum for NGSS alignment: Oversimplification of cognitive load and separation of the three dimensions* [Paper presentation]. NARST 92nd Annual International Conference, Baltimore, MD.

Lowell, B.R., Reigh, E.V. & Ribay, K. (2019, March 31-April 3). *From inquiry to the science and engineering practices: Implications for professional development* [Poster presentation]. NARST 92nd Annual International Conference, Baltimore, MD.

McNeill, K.L., Cherbow, K., **Lowell, B.R.**, & Lowenhaupt, R. (2019, March 31-April 3). *Supporting k-8 principals' vision of science instruction: Shifting towards science as practice through professional development* [Paper presentation]. NARST 92nd Annual International Conference, Baltimore, MD.

Lowenhaupt R., **Lowell, B.R.**, Cherbow, K. & McNeill, K.L. (2018, November 14-18). *Preparing principals for innovating in science supervision: Leadership Content Knowledge to support science reform* [Paper presentation]. University Council for Educational Administration Convention, Houston, TX.

PROFESSIONAL DEVELOPMENT WORKSHOPS

Lowell, B.R., Noll, J.D., Kamerer, B. & Ham, J.-S. (2023, March 25). *More than just a hook: using anchoring phenomena to support student sensemaking throughout an entire unit*. Workshop presented at the annual conference of the National Science Teaching Association, Atlanta, GA.

Affolter, R., McNeill, K.L., **Lowell, B.R.**, Kamerer, B. (2023, March 24). *Classroom discussions where students "figure it out:" Using different teacher moves depending on the goal of the discussion*. Workshop presented at the annual conference of the National Science Teaching Association, Atlanta, GA.

Affolter, R., **Lowell, B.R.**, Paul Metcalf, H., & Dunne, M. (2023, March 24). *Using an observation tool to support rigorous student-centered, phenomenon-based instruction*. Workshop presented at the annual conference of the National Science Teaching Association, Atlanta, GA.

Lowell, B.R. & Novak, M. (2023, Jan 31-Feb 1). *OpenSciEd Scientific Language Development High School Professional Learning: Fuels Unit*. Two-day workshop to support Massachusetts high school chemistry teachers field testing the OpenSciEd Energy from Chemical & Nuclear Reactions unit, Dover, MA.

Affolter, A. & **Lowell, B.R.** (2023, January 25-26). *OpenSciEd Universal Design for Learning Professional Learning*. Two-day workshop to support Massachusetts middle school teachers implementing OpenSciEd as part of the OpenSciEd Equitable Instruction Initiative, North Hadley, MA.

Affolter, A. & **Lowell, B.R.** (2023, January 23-24). *OpenSciEd Student Sensemaking Professional Learning*. Two-day workshop to support Massachusetts middle school teachers implementing OpenSciEd as part of the OpenSciEd Equitable Instruction Initiative, North Hadley, MA.

Paul Metcalf, H. & **Lowell, B.R.** (2022, December 20-21). *OpenSciEd Mathematical Thinking High School Professional Learning: Meteors Unit*. Two-day workshop to support Massachusetts high school physics teachers field testing the OpenSciEd Meteors, Orbits, and Gravity unit, Dover, MA.

Lowenhaupt, R.; **Lowell, B.R.**, & Cherbow, K. (2022, November 10, 17, December 8). *Implementing the Science Practices in K-8 Science*. Three-session webinar for New York State Association of Supervision and Curriculum members. Presented virtually.

Lowell, B.R. & Novak, D. (2022, October 12-13). *OpenSciEd Universal Design for Learning High School Professional Learning: Space Survival Unit*. Two-day workshop to support Massachusetts high school chemistry teachers field testing the OpenSciEd Molecular Processes in Earth Systems unit, Dover, MA.

Lowell, B.R. & Novak, M. (2022, August 16-18). *OpenSciEd Equitable Sensemaking High School Professional Learning: Lightning Unit*. Three-day workshop to support Massachusetts high school chemistry teachers field testing the OpenSciEd Structure & Properties of Matter unit, Boston, MA.

Affolter, A. & **Lowell, B.R.** (2022, August 9-10). *OpenSciEd Equitable Discussions Professional Learning*. Two-day workshop to support Massachusetts middle school teachers implementing OpenSciEd as part of the OpenSciEd Equitable Instruction Initiative, Springfield, MA.

Affolter, A. & **Lowell, B.R.** (2022, June 29-30). *OpenSciEd Equitable Discussions Professional Learning*. Two-day workshop to support Massachusetts middle school teachers implementing OpenSciEd as part of the OpenSciEd Equitable Instruction Initiative, Dover, MA.

Affolter, A. & **Lowell, B.R.** (2022, June 27-28). *OpenSciEd Equitable Discussions Professional Learning*. Two-day workshop to support Massachusetts middle school teachers implementing OpenSciEd as part of the OpenSciEd Equitable Instruction Initiative, Dover, MA.

Mills, W. & **Lowell, B.R.** (2022, February 1-2). *Elevating Student Sensemaking using OpenSciEd's Key Instructional Elements: Contact Forces Unit*. Two-day workshop to support Massachusetts 7th grade teachers implementing OpenSciEd Contact Forces unit as part of the OpenSciEd Equitable Instruction Initiative, Dover, MA.

Lo, A. & **Lowell, B.R.** (2021, January 25-26 & February 1-2). *OpenSciEd Supporting Writing and Drawing for Sensemaking: Cells Unit Teacher Professional Learning*. Four-day workshop to support Massachusetts teachers implementing OpenSciEd Cells unit, presented virtually.

Lo, A. & **Lowell, B.R.** (2020, December 9-10, 14-15, & 2021, January 12). *OpenSciEd Supporting Writing and Drawing for Sensemaking: Cells Unit Facilitator Professional Learning*. Five-day workshop to support OpenSciEd professional learning facilitators, presented virtually.

Lo, A. & **Lowell, B.R.** (2020, August 11-14). *OpenSciEd Supporting Diverse Learners with UDL: Natural Hazards Unit Teacher Professional Learning*. Four-day workshop to support Massachusetts teachers implementing OpenSciEd Natural Hazards unit, presented virtually.

Lo, A. & **Lowell, B.R.** (2020, June 10-11 & 15-16). *OpenSciEd Supporting Diverse Learners with UDL: Natural Hazards Unit Facilitator Professional Learning*. Four-day workshop to support OpenSciEd professional learning facilitators, presented virtually.

Lowell, B.R. & Noll, J.D. (2020, April 2-5). *More Than Just a Hook—Using Anchoring Phenomena to Support Student Sensemaking throughout an Entire Unit*. Workshop presented at the annual conference of the National Science Teaching Association, Boston, MA. (Conference canceled).

Novak, M. & **Lowell, B.R.** (2020, January 30-31). *OpenSciEd Utilizing the Assessment System: Genetics Unit Teacher Professional Learning*. Two-day workshop to support Massachusetts teachers implementing OpenSciEd Genetics unit, Waltham, MA.

Novak, M. & **Lowell, B.R.** (2019, December 16-18). *OpenSciEd Utilizing the Assessment System: Genetics Unit Facilitator Professional Learning*. Three-day workshop to support OpenSciEd professional learning facilitators, Austin, TX.

Cherbow, K., **Lowell, B.R.**, McNeill, K.L., Lowenhaupt, R. (2019, April 11-14). *Supporting instruction in the critiquing science practices: Arguing from evidence and evaluating information*. Workshop presented at the annual conference of the National Science Teachers Association, St. Louis, MO.

Lowell, B.R., Benz, G. (2018, November 30-December 2). *ChemEx²: Chemistry Experiments and Experiences for Learning*. 3-hour short course presented at the annual meeting of the California Science Teachers Association, Pasadena, CA.

Lowell, B.R., Seebode, S., Benz, G. (2018, June 25-29). *ChemEx²: Chemistry Experiences and Experiments for Learning*. 5-day professional development course presented through Stanford Center to Support Excellence in Teaching, Stanford, CA.

Lowell, B.R., Cherbow, K. (2018, April 26). *Instructional Leadership for Science Practices (ILSP): An introduction to the tools and resources*. Workshop presented to the BaySci partnership at the Lawrence Hall of Science, Berkeley, CA.

Benz, G., Doyle, K., **Lowell, B.R.**, Seebode, S. (2017, July 25-28 & July 31-August 3). *ChemEx²: Chemistry Experiences and Experiments for Learning*. 8-day professional development course presented through Stanford Center to Support Excellence in Teaching, Stanford, CA.

Crawford, C., **Lowell, B.R.**, Kwong, W. (2017, March 13). *Introduction to the NGSS: Shifts for the Physical Science Classroom*. Workshop presented to the Fremont Union High School District, Sunnyvale, CA.

Rotter K., Benz G., Seebode, S., **Lowell, B.R.** (2016, July 26-28 & August 1-4). *ChemEx²: Chemistry Experiences and Experiments for Learning*. 8-day professional development course presented through Stanford Center to Support Excellence in Teaching, Stanford, CA.

GRANT WRITING EXPERIENCE

Supporting teacher customizations of curriculum materials for equitable student sensemaking in secondary science 2021

Funded by National Science Foundation, DRK-12 Grant #2101384

Principal Investigators: Katherine McNeill, Brian Reiser (co-PI), Renee Affolter (co-PI)

My work: contributed to proposal; contributed to annual report

OpenSciEd Equitable Instruction Initiative 2021

Funded by One8 foundation

Principal Investigator: Katherine McNeill

My work: contributed to proposal

- OpenSciEd Middle School Developers Consortium 2018
 Funded by National Center for Civic Innovation, Inc with support from Bill & Melinda Gates Foundation, Carnegie Corporation of New York, Charles and Lynn Schusterman Family Foundation, William and Flora Hewlett Foundation
 Principal Investigators: Daniel Edelson, Katherine McNeill (co-PI), Brian Reiser (co-PI)
 My work: contributed to monthly reports
- Distributed Instructional Leadership for the Science Practices 2017
 Unfunded proposal submitted to National Science Foundation
 Principal Investigators: Katherine McNeill, Rebecca Lowenhaupt (co-PI)
 My work: contributed to proposal
- Instructional Leadership for the Science Practices 2017
 Funded by National Science Foundation, DRK-12 Grant #1415541
 Principal Investigators: Katherine McNeill, Rebecca Lowenhaupt (co-PI)
 My work: contributed to annual reports

PROFESSIONAL SERVICE

- Member of Digital Promise OpenSciEd Research Community Program Committee 2023-2024
- Grant Proposal Reviewer
 National Science Foundation 2023
- Manuscript Reviewer
 Science Education 2021-2023
 Journal of Research on Science Teaching 2023
- Proposal Reviewer
 NARST International Conference 2019-2023
 AERA Annual Conference 2021

HONORS AND AWARDS

- NSTA/NARST Research Worth Reading Award for the article
 “Considering discussion types to support collective sensemaking in a storyline unit” 2023
- Math for America Berkeley Master Teacher Fellow 2015
- Leonore Annenberg Woodrow Wilson Teaching Fellow 2010
- Associate Member of Sigma Xi 2010

CERTIFICATIONS

- California Single Subject Teaching Credential 2011-present
 Clear credential in chemistry and life science with English Language Learners endorsement

MEMBERSHIPS

Association for Science Teacher Education (ASTE)	2023-present
International Society of the Learning Sciences (ISLS)	2020-present
American Educational Research Association (AERA)	2019-present
NARST	2017-present
National Science Teaching Association (NSTA)	2013-present