Kristen Bethke Wendell

Tufts University
200 College Ave., Robinson 169, Somerville, MA 02144
kristen.wendell@tufts.edu

2011	Ph.D.	Tufts University, Science Education
2005	M.S.	Massachusetts Institute of Technology, Aeronautics and Astronautics
2003	B.S.	Princeton University, Mechanical and Aerospace Engineering *Phi Beta Kappa, Summa Cum Laude*

PROFESSIONAL APPOINTMENTS

Tufts University, Medford, MA — Jan. 2016 - present
Assistant Professor, Department of Mechanical Engineering
Adjunct Assistant Professor, Department of Education
McDonnell Family Assistant Professor of Engineering Education
Faculty Fellow, Center for Engineering Education and Outreach

University of Massachusetts Boston — 2011 – Dec. 2015
Assistant Professor, Department of Curriculum and Instruction
Faculty, Center of Science and Mathematics in Context (COSMIC)

Center for Engineering Education and Outreach, Tufts University — 2006 - 2011
Research Assistant and Program Coordinator

National Academy of Sciences, Washington, D.C. — 2005
Christine Mirzayan Science and Technology Policy Graduate Fellow
Worked under Dr. Norman Fortenberry at CASEE within the National Academy of Engineering.

Man Vehicle Laboratory, Massachusetts Institute of Technology — 2003 - 2006
Research Assistant. Studied advanced spacesuit design with Dr. Dava Newman

Spacecraft and Sensors Branch, NASA Langley Research Center, Hampton, VA — 2001 - 2002
Research Assistant. Engineering concepts for interplanetary missions; mission simulation software development.

Argonne National Laboratory, U.S. Department of Energy, Argonne, IL
Mechanical Engineering Intern — 2000
Solid modeling Spallation Neutron Source instruments using Pro/Engineer CAD software.

AWARDS

- Nominee, *Journal of Engineering Education* Wickenden Award for Best Scholarly Article, 2018
- Named one of American Society for Engineering Education (ASEE) "Early Risers: 20 High-Achieving Researchers and Educators Under 40," ASEE PRISM, Summer 2018
- Tufts American Society of Mechanical Engineers (ASME) Student Chapter Professor of the Year, 2017
- United States Presidential Early Career Award for Scientists and Engineers (PECASE), 2016
- National Science Foundation CAREER Award, 2013
- International Conference of the Learning Sciences (ICLS) Doctoral Consortium Fellow, June 2010
- Service Leadership Award, Massachusetts Institute of Technology, June 2006

- Passed MIT Aeronautics and Astronautics Ph.D. Qualifying Examination, January 2005
- National Science Foundation Graduate Research Fellowship, 2003-2005
- Princeton Hayes-Palmer Prize in Engineering, 2003 (for top two graduating engineering students)
- Tau Beta Pi, 2002 (national engineering honor society)
- Barry M. Goldwater Scholarship, 2002

TEACHING EXPERIENCE

Tufts University, Medford, MA 2016 - present
- *ME 171: Engineering Education Design*
- *ME 43: Senior Design Project in Mechanical Engineering*

University of Massachusetts Boston, Boston, MA 2011 - 2015
- *EDCG 619: Designing Instruction in Science at the Elementary Level*
- *ECHD 441/641: Science and Math Instruction for All Young Children*
- *PHYSIC 597: Infusing Engineering into High School Physics*
- *EDCG 697: Incorporating Engineering Design into Elementary School*

Tufts University, Department of Education and the Center for Eng. Educ. & Outreach 2007 - 2011
- *ED 211: Some of What Matters about Matter: Intensive Properties* (Fall 2010)
- *ED 111: The Development of Knowledge and Reasoning in Science* (Fall 2009)
- *Practicum Supervisor for Student Teachers* (2008-2011)
- *Professional Development Instructor* (Summers 2007 – 2009)

Benjamin Banneker Charter Public School, Cambridge, MA 2006 - 2008
Student Teacher: Taught weekly engineering and robotics lessons to 3rd and 4th grade students.

Museum of Science Boston, Boston, MA Summer 2006
Instructor: Developed and taught three courses at summer science program for children.

Massachusetts Institute of Technology, Cambridge, MA 2005
Teaching Assistant: Graduate-level course *Aerospace Biomedical and Life Support Engineering*.

MIT Student-Teacher Outreach-Mentorship Program*,* Cambridge, MA 2005-2006
Program Leader: Co-founded MIT student group to assist local K-8 teachers in incorporating robotics and engineering into their classrooms. Planned curriculum and trained MIT students.

PEER-REVIEWED JOURNAL ARTICLES AND BOOK

Wendell, K. B., Andrews, C. J., & Paugh, P. (in press). Supporting knowledge construction in elementary engineering design. *Science Education.*

Wendell, K. B., Swenson, J. E., & Dalvi, T. S. (2019, Online First). Epistemological framing and novice elementary teachers' approaches to learning and teaching engineering design. *Journal of Research in Science Teaching.*

Paugh, P., Wendell, K., & Wright, C. (2018). Elementary engineering as a synergistic site for disciplinary and linguistic learning in an urban classroom. *Literacy Research: Theory, Method, and Practice.* DOI: https://doi.org/10.1177/2381336918786937

Wright, C.G., Wendell, K.B., & Paugh, P.P. (2018). "Just put it together to make no commotion:" Re-imagining urban elementary students' participation in engineering design practices. *International Journal of Education in Mathematics, Science and Technology, 6*(3), 285-301. DOI: 10.18404/ijemst.428192

Watkins, J., McCormick, M., Wendell, K., Spencer, K., Milto, E., Portsmore, M., & Hammer, D. (2018). Data-based conjectures for supporting responsive teaching in engineering design with elementary teachers. *Science Education, 102*(3), 548-570.

Paugh, P., Wendell, K. B., Gilbert, M., & Power, C. (2017). "It's not that easy to solve": edTPA and preservice teacher learning. *Teaching Education, 29*(2), 147-164.

Johnson, A., Wendell, K. B., & Watkins, J. (2017). Examining experienced teachers' noticing of and responses to students' engineering. *Journal of Pre-College Engineering Education Research, 7*(1), Article 2.

Wendell, K. B., Wright, C. G., & Paugh, P. (2017). Reflective decision-making in elementary students' engineering design. *Journal of Engineering Education, 106*(3), 356-397.

Dalvi, T., & Wendell, K. B. (2017). Using student video cases to assess pre-service elementary teachers' engineering teaching responsiveness. *Research in Science Education, 47*(5), 1101-1125.

Dalvi, T., Wendell, K. B., & Johnson, J. (2016). Community-based engineering: Experiences from a 2nd grade urban classroom. *Young Children, 71*(5), 8-15.

Stone-MacDonald, A., Wendell, K., Douglass, A., & Love, M. L. (2015). *Engaging young engineers: Teaching problem solving skills through STEM.* Baltimore, MD: Brookes Publishing.

Dalvi, T., & Wendell, K. B. (2015). Community-based engineering. *Science and Children, 53*(1). 67-73.

Wendell, K. B. (2014). Design practices of pre-service elementary teachers in an integrated engineering and literature experience. *Journal of Pre-College Engineering Education Research, 4(2)*, Article 4.

Wendell, K. B., & Rogers, C. (2013). Engineering-design-based science, science content performance, and science attitudes in elementary school. *Journal of Engineering Education, 102*(4), 513-540.

Wendell, K.B. (2012). Just right: Students design a model house to learn about the properties of materials. *Science and Children, 50*(4), 46-53.

Wendell, K.B., & Lee, H.-S. (2010). Elementary students' learning of materials science practices through instruction based on engineering design tasks. *Journal of Science Education and Technology, 19*(6), 580-601.

Rogers, C., Foster, J., & Wendell, K. B. (2010). A review of the NAE report on engineering in K-12 education. *Journal of Engineering Education*, *99*(2), 179-181.

PEER-REVIEWED BOOK CHAPTERS

Wendell, K. (2018). Design, analysis, models, and systems as four core concepts for engineering infusion. In A. Eisenkraft & S-Y Chen Freake (Eds.) *Beyond the egg drop: Infusing engineering into high school physics.* NSTA Press.

Dalvi, T., & Wendell, K. B., (2016). Community-based engineering. In L. Froschauer (Ed.) *Bringing STEM to the elementary classroom.* National Science Teachers Association Press.
NOTE: This chapter is a re-print of Dalvi & Wendell's 2015 article in *Science & Children.*

Milto, E., Wendell, K., Watkins, J., Hammer, D., Spencer, K., Portsmore, M. & Rogers, C. (2016). Elementary school engineering for fictional clients in children's literature. In L. Annetta & J. Minogue (Eds.), *Connecting science and engineering education practices in meaningful ways.* Springer.

Custer, R., Eisenkraft, A., Wendell, K., Daugherty, J., & Ross, J. (2016). Infusing engineering concepts into high school science: Opportunities and challenges. In L. Annetta & J. Minogue (Eds.), *Connecting science and engineering education practices in meaningful ways.* Springer.

Wendell, K. B., & Kolodner, J. (2014). Learning disciplinary concepts and practices through engineering design. In B. Olds and A. Johri (Eds.), *Cambridge handbook of engineering education research.* Cambridge University Press.

Wendell, K. B. (2014). Opportunities for reasoning about energy within elementary school engineering experiences. In R. F. Chen, A. Eisenkraft, D. Fortus, J. Krajcik, K. Neumann, J. C. Nordine, & A. Scheff (Eds.), *Teaching and learning of energy in K-12 education.* New York: Springer.

Wendell, K., Kendall, A., Portsmore, M., Wright, C., Jarvin, L., & Rogers, C. (2014). Embedding elementary school science instruction in engineering design problem solving. In S. Purzer, J. Strobel, & M. Cardella (Eds.), *Engineering in pre-college settings: Synthesizing research, policy, and practices.* Purdue University Press.

Wendell, K. B. (2013). Children's design constructions as representations of science ideas. In B. Brizuela and B. Gravel (Eds.), *"Show me what you know" Exploring representations across STEM disciplines*. Teachers College Press.

PEER-REVIEWED CONFERENCE PROCEEDINGS

Batrouny, N. A., Wendell, K. B., & Dalvi, T. (2018). Elementary students' disciplinary practices during integrated science and engineering units (Work in Progress). *Proceedings of the 125th American Society for Engineering Education Annual Conference and Exposition*. Salt Lake City, UT.

Gallegos, H., Wendell, K. B., & Swenson, J. (2018). WIP: An interview study of faculty, course assistant, and student insight within teaching and learning assistant programs for undergraduate engineering courses. *Proceedings of the 125th American Society for Engineering Education Annual Conference and Exposition*. Salt Lake City, UT.

LeBow, R., Wendell, K. B., & Swenson, J. (2018). WIP: High-achieving students' perceptions of and approaches to problem solving in introductory engineering science courses. *Proceedings of the 125th American Society for Engineering Education Annual Conference and Exposition. Salt Lake City, UT.*

Wendell, K. B., Andrews, C., & Paugh, P. (2018). Multimodal engineering design notebooks and meta-representational competence. *Proceedings of the 11th International Conference of the Learning Sciences*, London, UK.

Shaw, F., Wendell, K.B., Bernstein, D., Puttick, G., & Danahy, E. (2018). Problem scoping in designing biomimetic robots. *Proceedings of the 11th International Conference of the Learning Sciences*, London, UK.

Swenson, J., & Wendell, K. B. (2017). Characterizing indicators of students' productive disciplinary engagement in solving fluid mechanics problems. *Proceedings of the 124th American Society for Engineering Education Annual Conference and Exposition.* Columbus, OH.

Wendell, K. B., & Andrews, C. J. (2017). Elementary student engagement with digital engineering notebook cards. *Proceedings of the 124th American Society for Engineering Education Annual Conference and Exposition.* Columbus, OH.

Swenson, J. & Wendell, K. B. (2016). A case study of students' engagement in a control systems homework problem. *IEEE Frontiers in Education.* Erie, PA.

Shaw, F. & Wendell, K. B. (2016). Examining two learner approaches in a making activity with university students. *IEEE Frontiers in Education.* Erie, PA.

Wendell, K. B., Swenson, J., & Dalvi, T. (2016). Learning engineering and teaching engineering: Comparing the engineering epistemologies of two novice teachers with distinct pedagogies of design. *Proceedings of the 123rd American Society for Engineering Education Annual Conference and Exposition.* New Orleans, LA.

Johnson, A. W., Wendell, K., & Watkins, J. (2016). Dimensions of experienced responsive teaching in engineering. *Proceedings of the 123rd American Society for Engineering Education Annual Conference and Exposition.* New Orleans, LA.

Wendell, K., Watkins, J., & Johnson, A.W. (2016). Noticing, assessing, and responding to students' engineering: Exploring a responsive teaching approach to engineering design. *Proceedings of the 123rd American Society for Engineering Education Annual Conference and Exposition.* New Orleans, LA.

Swenson, J., Wendell, K. B., & Dalvi, T. (2015). Introducing engineering and making to urban pre-service teachers through community-based projects. *Proceedings of FabLearn* 2015, Palo Alto, CA.

Wendell, K. B., Wright, C. W., & Paugh, P. (2015). Urban elementary school students' reflective decision-making during formal engineering learning experiences. *Proceedings of the 122nd American Society for Engineering Education Annual Conference and Exposition.* Seattle, WA.

Wendell, K. B., & Dalvi, T. (2014). Community-based engineering and novice elementary teachers' knowledge of engineering practices. *Proceedings of the 9th International Conference of the Learning Sciences*, Boulder, CO.

Wright, C., Wendell, K., & Paugh, P. (2014). Reflective decision making within the discourse of urban elementary engineering classrooms. *Proceedings of the 9th International Conference of the Learning Sciences*, Boulder, CO.

Wendell, K. B. (2014). The video case diagnosis task: Assessing pre-service teachers' knowledge of engineering design practices. *Proceedings of the 121st American Society for Engineering Education Annual Conference and Exposition.* Indianapolis, IN.

Wendell, K. B., Wright, C., & Paugh, P. (2014). Supporting children's engineering discourse and decision-making with multimedia engineering notebook tools. *Proceedings of the 121st American Society for Engineering Education Annual Conference and Exposition.* Indianapolis, IN.

McCormick, M., Wendell, K., & O'Connell, B. (2014). Student videos as a tool for elementary teacher development in teaching engineering: What do teachers notice? *Proceedings of the 121st American Society for Engineering Education Annual Conference and Exposition.* Indianapolis, IN.

Wendell, K. B. (2013). Pre-service teachers' engineering practices in an integrating engineering and literacy experience. *Proceedings of the 120th American Society for Engineering Education Annual Conference & Exposition*, Atlanta, Georgia.

Kendall, A., & Wendell, K. B. (2012). Understanding the beliefs and perceptions of teachers who choose to implement engineering-based science instruction. *Proceedings of the 119th American Society for Engineering Education Annual Conference & Exposition*, Austin, Texas.

Wendell, K. B., Portsmore, M., Wright, C. G., Rogers, C., Jarvin, L., & Kendall, A. (2011). The impact of engineering-based science instruction on science content understanding. *Proceedings of the 118th American Society for Engineering Education Annual Conference & Exposition*. Vancouver, British Columbia.

Wendell, K. B., Connolly, K. G., Wright, C. G., Jarvin, L., Rogers, C., Barnett, M., & Marulcu, I. (2010). Incorporating engineering design into elementary school science curricula. *Proceedings of the 117thAmerican Society for Engineering Education Annual Conference & Exposition*. Louisville, KY.

Bethke, K. A., & Newman, D. J. (2006). Applying K-8 science and technology curricula to engineering education: What can be learned from the Educator Resource Center at the Museum of Science, Boston. *Proceedings of the 113th American Society for Engineering Education Annual Conference & Exposition.* Chicago, IL.

Newman, D. J., Bethke, K. A., Hoffman, J., Carr, C., & Trotti, G. (2004). Astronaut bio-suit system to enable planetary exploration. *International Astronautical Federation - 55th International Astronautical Congress 2004, 12,* 7708-7718.

Bethke, K. A., Carr, C. E., Pitts, B. M., & Newman, D. J. (2004). Bio-suit development: Viable options for mechanical counterpressure? 34th International Conference on Environmental Systems, Colorado Springs, Colorado, July, 2004. *SAE 2004 Transactions Journal of Aerospace, 113*(1), 426-437. SAE paper 2004-01-2294.

Troutman, P. A., Bethke, K. A., Stillwagen, F., Caldwell, D. L., Manvi, R., Strickland, C., & Krizan, S. A. (2003). Revolutionary concepts for human outer planet exploration. Space Technology and Applications International Forum. *AIP Conference Proceedings, 654*, 821-828.

INVITED JOURNAL ARTICLES

Wendell, K. B., & Rogers, C. (2014). Kids and science: Motivated and confident to begin with, they learn more through design challenges. *ASEE Prism, January 2014.*

GRANTS

Bernstein, D., Puttick, G., Wendell, K. B., & Danahy, E. (2017). *Designing biomimetic robots: Researching the impact of an interdisciplinary bio-engineering-computational design curriculum on middle school engineering and science education.* Co-Principal Investigator for a three-year, **$319,175** sub-award to Tufts. In collaboration with Dr. Debra Bernstein and Dr. Gilly Puttick at TERC, Cambridge, MA, and Dr. Ethan Danahy at Tufts. Total award $1,198,780 from NSF to TERC.

Wendell, K. B., & Dalvi, T. (2016). *Connections in the Making: Elementary Students, Teachers, and STEM Professionals Integrating Science and Engineering to Design Community Solutions.* Principal Investigator for a three-year, **$987,300** award from the National Science Foundation to develop and study integrated engineering and science curriculum units for grades 3 through 5. In collaboration with Dr. Tejaswini Dalvi at UMASS Boston, the MBTA, Boston Public Schools, and Marlborough Public Schools.

Wendell, K. B., Wright, C., & Paugh, P. (2013). *Multimedia Engineering Notebook Tools to Support Engineering Discourse in Urban Elementary School Classrooms.* Principal Investigator for a three-year, **$262,806** award from the National Science Foundation to develop and study multimedia engineering notebook tools that support reflective decision-making for engineering design in elementary school classrooms. In collaboration with Dr. Patricia Paugh at UMASS Boston and Dr. Christopher Wright at University of Tennessee.

Wendell, K. B. (2013). *CAREER: Community-Based Engineering as a Learning and Teaching Strategy for Pre-Service Urban Elementary Teachers.* Principal Investigator for a five-year, **$598,269** award from the National Science Foundation to use community-based engineering experiences to improve the abilities of novice, urban elementary teachers to identify and respond to students' emerging science and engineering ideas and practices.

Wendell, K. B., & Denning, C. (2012). *STEM Summer Learning Institute for Early Childhood Educators.* Co-Principal Investigator for a **$17,000** award from the Massachusetts Department of Early Education and Care to develop and deliver a two-day professional development on early childhood science, math, and engineering education.

Wendell, K. B. (2011). *Integrating Engineering and Literacy* Project. Responsible Investigator of sub-award to UMass Boston from the National Science Foundation grant DRL-1020243 to Tufts University. Sub-award of **$40,000** for Sep. 2011 to Aug. 2013 to investigate strategies for preparing pre-service and novice elementary school teachers to incorporate engineering into their literacy instruction.

Bethke, K. A., Jarvin, L., Rogers, C., & Barnett, G.M. (2006). *Transforming Elementary Science Learning through LEGO™ Engineering Design.* Lead author of proposal submitted to the National Science Foundation REESE program. Awarded **$998,416** in Aug. 2006, DRL-0633952.

Bethke, K. A., (2004). *FloodSafe Honduras International Development Service Learning.* Grant proposal submitted to Thrivent Financial. Awarded **$25,000** in October 2004 to expand MIT student project in flood warning system and water chlorination engineering in Honduras.

CURRICULUM MATERIALS

Wendell, K. B., Connolly, K., Wright, C., Jarvin, L., Rogers, C., & Barnett, G. M. (2007). *Design a Musical Instrument: The Science of Sound.* Design-based science curriculum unit developed for upper elementary students. Supported by the National Science Foundation. Available at http://legoengineering.com/curriculum-submenuteachingresources-142.html

Wendell, K. B., Connolly, K., Wright, C., Jarvin, L., Rogers, C., & Barnett, G. M. (2007). *Design a Model House: The Properties of Materials.* Design-based science curriculum unit developed for upper elementary students. Supported by the National Science Foundation. Available at http://legoengineering.com/curriculum-submenuteachingresources-142.html

Wendell, K. B., Connolly, K., Wright, C., Jarvin, L., Rogers, C., & Barnett, G. M. (2008). *Design an Animal Model: Animal Studies.* Design-based science curriculum unit developed for upper elementary students. Supported by the National Science Foundation. Available at http://legoengineering.com/curriculum-submenuteachingresources-142.html

Connolly, K., Wendell, K. B., Wright, C., Jarvin, L., Rogers, C., & Barnett, G. M. (2008). *Design a People Mover: Simple Machines.* Design-based science curriculum unit developed for upper elementary students. Supported by the National Science Foundation. Available at http://legoengineering.com/curriculum-submenuteachingresources-142.html

---

CONFERENCE PAPERS AND PRESENTATIONS (PEER-REVIEWED, NO PROCEEDINGS)

Swenson, J., & Wendell, K. (2018, April). *First-year teacher beliefs about the value of engineering education for newcomer students.* Paper presented at the American Educational Research Association (AERA), New York, NY.

Paugh, P., Wendell, K., Andrews, C., & Wrigh, C. G. (2018, April). *Aligning disciplinary literacy instruction with engineering practices in urban fourth and fifth grade classroom.* Paper presented at the American Educational Research Association (AERA), New York, NY.

Wright, C. G., Likely, R., Paugh, P. C., & Wendell, K. (2018, April). *Examining access to identity resources in becoming teachers-of-engineering: the cases of Eboni and Henrietta.* Paper presented at the American Educational Research Association (AERA), New York, NY.

Paugh, P., & Wendell, K. (2017, December). *Engineering design and development of disciplinary literacies in urban elementary classrooms.* Paper presented at the 67th Annual Conference of the Literary Research Association (LRA), Tampa, FL.

Fu, L., Wendell, K., & Miel, K. (2017, June). *Student perceptions of abundance: A case study of two classrooms using the portable maker workshop*. Poster presented at the Jean Piaget Society, San Francisco, CA.

Wendell, K., & Andrews, C. (2017, April). *Multimedia notebook cards in support of engineering design practices and disciplinary discourse in elementary school.* Paper presented at the National Association of Research in Science Teaching (NARST), San Antonio, TX.

Dalvi, T., Mangiante, E., & Wendell, K. (2017, April). *A curriculum critique and revision task to assess PCK for NGSS practices.* Paper presented at the National Association of Research in Science Teaching (NARST), San Antonio, TX.

Wendell, K., Johnson, A., Danahy, E., Rogers, C., Cunningham, C., Chiu, J., Wongkamalasai, M., Lehrer, R., & Rogers, C. (2016, August). *Perspectives on solution diversity and divergent thinking in K-12 engineering design learning experiences.* Symposium presented at the Discovery Research K-12 PI Meeting, National Science Foundation. Washington, D.C.

Andrews, C., & Wendell, K. (2016, August). *Designing a digital notebooking tool to support disciplinary discourse in elementary engineering.* Presentation at the P-12 Engineering and Design Education Research Summit. Chicago, IL.

Wendell, K., Wright, C., & Paugh, P. (2016, April). *Exploring ways to help urban elementary students meet the language and literacy demands of collaborative engineering design.* Paper presented at the National Association of Research in Science Teaching (NARST), Baltimore, MD.

Dalvi, T., & Wendell, K. (2016, April). *Exploring prospective elementary teachers' engineering teaching responsiveness through a video case diagnosis task.* Paper presented at the National Association of Research in Science Teaching (NARST), Baltimore, MD.

Dalvi, T., & Wendell, K. (2016, April). *Student and novice teacher learning of science ideas and engineering practices through Community-Based Engineering.* Paper presented at the American Educational Research Association (AERA), Washington, D.C.

Paugh, P., Wendell, K., & Wright, C. (2016, April). *The language of reflective decision making in urban elementary engineering design: A case study.* Paper presented at the American Educational Research Association (AERA), Washington, D.C.

Wright, C., Wendell, K., & Paugh, P. (2016, April). *Collaboration or cooperation in engineering design: Competing discourses for participating in reflective decision-making in an urban elementary classroom.* Paper presented at the American Educational Research Association (AERA), Washington, D.C.

Paugh, P., Wendell, K. & Wright, C. (2016, April). *Elementary engineers and the language of design.* Oral presentation at the Annual Conference of the American Association for Applied Linguistics (AAAL), Orlando, FL.

Paugh, P., Wendell, K., & Wright, C. (2015, May). *Building language along with ideas for elementary engineering.* Poster presented at the New England Educational Research Organization (NEERO), Dover, Vermont.

Paugh, P., Wendell, K., & Wright, C. (2015, April). *Discourses and ideas: A case study of ELLs reflective decision making in an elementary engineering curriculum.* Poster presented at the American Educational Research Association (AERA), Chicago, IL.

Wendell, K. B., Paugh, P., & Wright, C. (2015, April). *Engineering design as a disciplinary discourse: An exploration of language demands and resources among urban elementary students.* Paper presented at the National Association for Research in Science Teaching (NARST), Chicago, IL.

Dalvi, T., & Wendell, K. B. (2015, April). *Community based engineering: An approach for teaching and learning in urban elementary classroom environments.* Paper presented at the National Association for Research in Science Teaching (NARST), Chicago, IL.

Wendell, K. B. (2014, June). *The video case diagnosis task: Assessing pre-service teachers' knowledge of engineering design practices.* Poster and paper presented at the American Society for Engineering Education Annual Conference and Exposition (ASEE), Indianapolis, IN.

Wendell, K. B., Wright, C., & Paugh, P. (2014, June). *Supporting children's engineering discourse and decision-making with multimedia engineering notebook tools.* Poster and paper presented at the American Society for Engineering Education Annual Conference and Exposition (ASEE), Indianapolis, IN.

McCormick, M., Wendell, K., & O'Connell, B. (2014, June). *Student videos as a tool for elementary teacher development in teaching engineering: What do teachers notice?* Paper presented at the American Society for Engineering Education Annual Conference and Exposition (ASEE), Indianapolis, IN.

Paugh, P., Wendell, K., & Wright, C. (2014, May). *Investigating engineering discourse in urban elementary classrooms.* Roundtable presentation at the New England Educational Research Organization (NEERO), Dover, Vermont.

Wendell, K., & Lee, B. (2014, April). *Creating digital interactive engineering notebooks in a 1st grade classroom.* Presentation at the national conference of the National Science Teachers Association (NSTA), Boston, MA.

Wendell, K., Chen, S.-Y., van Beever, D., & Eisenkraft, A. (2014, April). *Infusing engineering into the high school physics curriculum.* Presentation at the national conference of the National Science Teachers Association (NSTA), Boston, MA.

Wendell, K. B. (2013, June). *Pre-service teachers' engineering practices in an integrating engineering and literacy experience.* Paper presented at the American Society for Engineering Education Annual Conference & Exposition (ASEE), Atlanta, Georgia.

Wendell, K. B. (2013, April). *Comparing elementary students' engineering design products across three classrooms enacting a design-based science curriculum.* Paper presented at the Annual Conference of the American Educational Research Association (AERA), San Francisco, CA.

Wendell, K. B. (2013, April). *Learning environment characteristics during engineering-design-based science in elementary school.* Paper presented at the Annual Conference of the American Educational Research Association (AERA), San Francisco, CA.

Paugh, P., Wendell, K. B., Gilbert, M., & Vanderberg, L. (2013, April). *Is the Teacher Performance Assessment (TPA) a vehicle for transformative praxis for an urban teacher education program?* Paper presented at the Annual Conference of the American Educational Research Association (AERA), San Francisco, CA.

Kendall, A., & Wendell, K. B. (2012, June). *Understanding the beliefs and perceptions of teachers who choose to implement engineering-based science instruction.* Paper presented at the American Society for Engineering Education Annual Conference & Exposition (ASEE), Austin, TX.

Wendell, K. B., & Portsmore, M. (2012, March). *A mixed methods approach to measuring learning through engineering.* Paper presented at the Annual International Conference of the National Association for Research in Science Teaching (NARST), Indianapolis, Indiana.

Wendell, K. B., Wright, C., Danish, J., Saleh, A., & Gravel, B. (2012, March). *Re-imagining context: Student-generated representations as tools for reasoning in science.* Symposium presented at the Annual International Conference of the National Association for Research in Science Teaching (NARST), Indianapolis, Indiana.

Wendell, K. B., Kendall, A., Portsmore, M., Wright, C., Jarvin, L., & Rogers, C. (2011, April). *Engineering-design-based science, science content learning, and science attitudes in the elementary grades.* Paper presented at the Annual International Conference of the National Association for Research in Science Teaching (NARST), Orlando, FL.

Wendell, K. B., Connolly, K. G., Wright, C. G., Jarvin, L., & Rogers, C. (2010, July). *Children learning science through engineering: An investigation of four engineering-design-based curriculum modules.* Poster presented at the International Conference of the Learning Sciences (ICLS), Chicago, IL.

Wendell, K. B., Connolly, K. G., Wright, C. G., Jarvin, L., Rogers, C., Barnett, M., & Marulcu, I. (2010, June). *Incorporating engineering design into elementary school science curricula*. Paper presented at the American Society for Engineering Education Annual Conference & Exposition (ASEE), Louisville, KY.

Connolly, K. G., Wendell, K. B., Wright, C. G., Jarvin, L., & Rogers, C. (2010, March). *Comparing children's simple machines learning in LEGO™ engineering-design-based and non-LEGO engineering-design-based science environments.* Paper presented at the Annual International Conference of the National Association for Research in Science Teaching (NARST), Philadelphia, PA.

Wendell, K. B., & Lee, H.-S. (2010, March). *Children's learning about materials science through engineering-design-based instruction.* Paper presented at the Annual International Conference of the National Association for Research in Science Teaching (NARST), Philadelphia, PA.

Marulcu, I., Barnett, M., Wendell, K. B., Connolly, K. G., Wright, C. G., Jarvin, L., & Rogers, C. (2009, April). *Pre-service elementary teachers' learning through LEGO engineering design challenges.* Paper presented at the Annual International Conference of the National Association for Research in Science Teaching (NARST), Orange County, CA.

Wendell, K. B., Connolly, K.G., Jarvin, L., Rogers, C., Wright, C.G., Barnett, M., & Marulcu, I. (2010, March). *Transforming science learning in the elementary grades through LEGO™ engineering design.* Poster presented at the National Science Foundation 2010 REESE Principal Investigators Meeting, Arlington, VA.

Wright, C. G., Wendell, K. B., Connolly, K. G., Jarvin, L., Rogers, C., Barnett, M., & Marulcu, I. (2009, April). *Transforming science learning in the elementary grades through LEGO™ engineering design.* Poster presented at the National Science Foundation 2009 REESE Principal Investigators Meeting, Arlington, VA.

Barnett, M., Bethke, K., Jarvin, L., & Rogers, C. (2006, December). *Transforming science learning in the elementary grades through LEGO™ engineering design.* Poster presented at the National Science Foundation 2006 REESE Principal Investigators Meeting, Arlington, VA.

Bethke, K., Newman, D. J., & Radovitzky, R. (2005, August). *Creating a skin strain field map with application to advanced locomotion spacesuit design.* Poster presented at the International Society of Biomechanics 20th Congress, Cleveland, OH.

OTHER PAPERS

Wendell, K. B. (2009). *Children's materials science practices before, during, and after a design-based science learning experience.* Dissertation qualifying paper. Tufts University. May 2009.

Wendell, K. B. (2008). *The theoretical and empirical basis for design-based science instruction for children.* Dissertation qualifying paper. Tufts University. March 2008.

Bethke, K. A. (2005). *The second skin approach: Skin strain field analysis and mechanical counter pressure prototyping for advanced spacesuit design*. M.S. Thesis. Massachusetts Institute of Technology. June 2005.

INVITED PRESENTATIONS

(2019, March). *Undergraduate mechanical design as argumentation from evidence*. Invited presentation to grade 6-12 science educators at district-wide professional development. Medford High School, Medford, MA.

(2019, March). *Design based research in elementary engineering education*. Drexel University. Invited guest lecture via Skype.

(2018, December). *Productive disciplinary engagement in engineering*. Invited presentation at the launch of the Tufts University Institute for Research on Learning and Instruction. Tufts University, Medford, MA.

(2018, June). Design Keeper: Digital notebooking in elementary engineering classrooms. Invited keynote at the Tufts University STEM Education Conference. Medford, MA.

(2018, June). Making connections: Engineering, science, and community. Invited keynote at the Tufts University STEM Education Conference. Medford, MA.

(2018, May). Design notebooking and knowledge building practices during elementary school engineering. Invited plenary flash talk. NSF ITEST PI and Evaluator Meeting. Alexandria, VA.

(2018, April). *Attending to disciplinary substance in elementary engineering curricula*. West Virginia University. Invited guest lecture via Skype.

(2018, March). *Engineering learning systems*. Invited presentation to the STOMP program at Tufts University, Medford, MA.

(2017, March). *Research in engineering education*. Purdue University. Invited guest lecture via Skype.

(2016, December). *Improving engineering education (for all) through a learning sciences approach.* Invited seminar at Boston University, Mechanical Engineering Department, Boston, MA.

(2016, November). *Engaging young engineers: Teaching problem solving and decision making skills through student centered design tasks.* Learning and the Brain Conference co-sponsored by Harvard University Graduate School of Education, Boston, MA.(2016, June). *Reflections on the current status of K-12 engineering education.* Invited panelist for the Pre-College Engineering Education Division of the American Society for Engineering Education, New Orleans, LA.

(2016, May). *Improving engineering education through a learning sciences approach.* Invited presentation to the Tufts University School of Engineering Board of Advisors.

(2016, February). *What is STEAM and why does it matter to learners?* Invited all-school presentation at the Pine Cobble School, Williamstown, MA.

(2015, April). *Panel discussion: Engineering education research methodologies*. Invited panel member at the National Association for Research in Science Teaching, Chicago, IL.

(2015, March). *Infusing engineering into middle and high school science learning experiences*. Invited presentation at the Noyce Northeast Conference in Cambridge, MA.

(2015, March). *Supporting elementary students' engineering discourse with talk moves and digital notebooks*. Invited presentation to the STOMP program at Tufts University Center for Engineering Education and Outreach, Medford, MA.

(2015, March). *Conceptualizing and conducting K-12 engineering education research studies*. Purdue University. Invited guest lecture via Skype.

(2013, November). *Engaging in STEM educational research through community partnerships.* Invited presentation to graduate students in the higher education program at Merrimack College, Boston, MA.

(2012, December). *Opportunities for reasoning about energy within elementary school engineering experiences*. Invited presentation at the Energy Summit at Michigan State University in Lansing, MI.

(2012, October). *Integrating engineering and literacy in the classroom: Bringing the "E" in STEM to your students*. Invited presentation at the Noyce Northeast Conference in Cambridge, MA.

(2012, March). *Engineering in elementary school: Emerging approaches, issues, and outcomes.* Invited presentation to the University of Massachusetts Curriculum and Instruction department.

(2011, June). *Comparing three enactments of an engineering-design-based curriculum on the science of sound.* Invited presentation at the LEGO Engineering Symposium in Medford, MA.

(2010, December). *Building teacher colleagues' science content knowledge.* Invited seminar for the K-12 teachers participating in the Tufts University Fulcrum Fellows program.

(2010, April). *Transforming education through engineering: An overview of educational research at the CEEO.* Invited presentation at the LEGO Engineering Conference in Enfield, CT.

(2009, March). *Transforming education through robotics and design: An overview of research at Tufts University.* Invited keynote address at the Rulang Primary School Robofest 2009. Jurong West, Singapore.

(2008, October). *Transforming an elementary science unit with a LEGO engineering project: Initial observations from a research study.* Invited presentation at the LEGO Engineering Conference in Woodstock, VT.

ADVISORY BOARDS

NSF SBIR Phase I grant, *A New Paradigm for Skill Development- A Training Platform Integrating Problem Solving and Mobile Programming to Create Peer-Led Skill Training for High School Student.* PI: Dr. Arun Saigal, Rappidly, Inc., 2018

NSF DRK-12 grant, *Developing Teacher Noticing in Engineering in an Online Professional Development Program.* PI: Dr. Jessica Watkins, Tufts University, 2017 - present

NSF STEM+C grant, *A Study of a Technology-enhanced Curriculum Integrating Science, Engineering Design, and Computational Modeling to Achieve Synergistic Learning with Elementary Students*. PI: Dr. Kevin McElhaney, SRI International, 2017 - present

NSF ITEST grant, *Impact of rE-Communities: Investigating how a collaboration between STEM educators and engineers impact underserved youth's participation in engineering design*. PI: Dr. Deena Khalil, Howard University, 2017 - 2018

NSF IUSE grant, *Impact of Flexible Classroom Spaces on Faculty Pedagogy and Student Behavior*. PI: Dr. Cindy Finelli, University of Michigan, 2017 - present

NSF DRK-12 grant, *Using Engineering Principles of Design to Advance Teacher Education of Prospective Elementary Teachers.* PI: Dr. Brenda Capobianco, Purdue University, 2016 - present

---

INVITED WORKSHOPS

Wendell, K. B., (2018, May). *Writing a syllabus and conveying expectations.* Workshop given at the Tufts Graduate Institute for Teaching. Medford, MA.

Wendell, K.B., Baird, F., Bitteti, S., Dahal, M., Danahy, E., Remiszewski, S., Reese, L.B., & Gravel, B., (2018, May). *Hands-on introduction to making and makerspaces for enhancing learning in university courses.* Workshop given at the Tufts University Teaching Conference. Medford, MA.

Swenson, J., & Wendell, K. B. (2016, June). *Community-based engineering.* Workshop given at the Tufts STEM Education Conference. Medford, MA.

Andrews, C., & Wendell, K. B. (2016, June). *Supporting design tasks.* Workshop given at the Tufts *STEM Education Conference*. Medford, MA.

Wendell, K. B. (2015, September). *Using STEM for math and literacy development in the early years.* Half-day professional development workshop presented to the Lowell Public Schools PreK Staff in Lowell, MA.

Wendell, K. B., & Love, M. L. (2015, March). *STEM and literacy in early childhood education.* Half-day professional development workshop presented to the Wellesley Public Schools Preschool Program in Wellesley, MA.

McCormick, M., Milto, E., Wendell, K., & Yang, L. (2014, April). *The Integrating Engineering and Literacy project: Engaging elementary students in engineering design challenges from children's literature.* One-hour professional development workshop presented at the national conference of the National Science Teachers Association (NSTA), Boston, MA.

Wendell, K. B. (2013, July). *Integrating engineering and literacy in elementary school.* Three-day professional development workshop presented at Tufts University.

Wendell, K. B. (2013, March). *Integrating engineering and literacy for "STEM" in early childhood.* Half-day professional development workshop presented for the South Middlesex Opportunity Council Child Care and Head Start Staff in Framingham, MA.

Love, M. L., & Wendell, K. B. (2013, January). *Early childhood math and the Common Core Standards.* Half-day professional development workshop presented for the Readiness Center at Bridgewater State University.

Wendell, K. B. (2012, November). *Engineering in early childhood education.* Half-day professional development workshop presented at the Marlborough Public Schools Early Childhood Center in Marlborough, MA.

Wendell, K. B. (2011, December). *Integrating engineering and literacy in elementary school.* One-hour professional development workshop presented at Holmes Elementary School, Boston, MA.

Wendell, K. B. (2009, March). *LEGO NXT robotics for primary teachers: Science explorations through LEGO NXT engineering design.* Workshop presented at Robofest 2009, Rulang Primary School, Jurong West, Singapore.

Wendell, K. B. (2009, March). *LEGO NXT robotics for secondary teachers: Teaching high school physics with LEGO NXT robotics*. Workshop presented at Robofest 2009, Rulang Primary School, Jurong West, Singapore.

Wendell, K. B. (2009, March). *Using the LEGO™ WeDo for children's mathematics, science, and language learning.* Workshop presented at the Science Centre Singapore, Jurong East, Singapore.

Wendell, K. B., Connolly, K., Marulcu, I. (2008, March). *Science explorations through LEGO engineering.* Workshop presented at the National Conference of the National Science Teachers Association, Boston, MA.

Wendell, K. B. (2008, August). *Teaching animal structure and behavior with LEGO engineering.* Workshop presented at the Sarah Greenwood School, Boston, MA.

Wendell, K.B. (2008, April). *Robots as people helpers.* Workshop presented at the Women in Science and Engineering Conference at Oak Middle School, Shrewsbury, MA.

Bethke, K., & Jarvin, L. (2007, May). *Transforming elementary science through LEGO™ engineering design: A model wind turbine activity.* Workshop presented at the Presidential Awards for Excellence in Mathematics and Science Teaching, National Science Foundation, Arlington, VA.

CONSULTING

Advisor, Joulez, Inc. (MassChallenge Start-Up 2016 Gold Winner) 2017 – 2018

University of Massachusetts Boston STEM Seminar in Early Education and Care May 2011
Contributed to syllabus, presented on engineering education in early childhood, and led hands-on engineering exploration for early childhood educators.

Tufts University Sackler School of Graduate Biomedical Sciences Fall 2010
Advised biomedical researchers on educational research questions and data collection instruments for their study of a new high school biomedical sciences curriculum.

Massachusetts Department of Elementary and Secondary Education November 2009
Summarized research related to learning about manufacturing engineering. Provided input on engineering learning progressions for the Science and Engineering/Technology Framework panel.

King Abdullah University of Science and Technology, Jeddah, Saudi Arabia January 2009
Facilitated team-building LEGO™ robotics workshop for matriculating graduate students from 40 different countries.

STUDENT RESEARCH ADVISING

Doctoral Chair:
Karen Miel (Science education)
Jessica Swenson (Mechanical engineering, May 2018)
Chelsea Andrews (Engineering education, August 2017)

Doctoral Committee Member:
Matthew Mueller (Mechanical engineering, May 2019)
Anna Phillips (Physics education, May 2019)
Elise Deitrick (Engineering education)
Brian O'Connell (Mechanical engineering, May 2017)
Mary McCormick (Engineering education, June 2015)

Qualifying Paper Reader:
Karen Miel (Science education)
Steve Cogger (Engineering education)
Elise Deitrick (Engineering education)
Chelsea Andrews (Engineering education)
Mary McCormick (Engineering education)

Master's Chair:
Nicole Batrouny (Mechanical engineering, May 2019)
Fatima Rahman (STEM education, August 2019)
Devyn Curley (Mechanical engineering, August 2017)

Master's Committee Member:
Kim Hallet (Human factors engineering)
Susan Bitetti (Mechanical engineering, December 2016)
Ganga Kasi (Human factors engineering, June 2016)
Kiley Brown (Biology education, March 2014)

Undergraduate Thesis/Independent Research:
Talisa Watts (undergraduate LSAMP program, 2018-19)
Elizabeth Moison (Summer Scholars 2018)
Hernán Gallegos (undergraduate research LSAMP program, 2017-18)
Zaila Foster (undergraduate research LSAMP program, 2017-18)
Sara Willner-Giwerc (Mechanical engineering senior thesis, 2017-18)
Liren Fu (Interdisciplinary senior thesis, 2017-18)
Becca Lebow (Mechanical engineering independent research, Fall 2017)
August Frechette ((Mechanical engineering independent research, Fall 2017)
Rose Murray (Mechanical engineering independent research, Spring 2017)
Alexandria Trombley (Human factors senior thesis, 2016-2017)

SERVICE

Leadership

- Associate Editor, *Journal of Engineering Education*, September 2018 - present
- Ad-hoc National Science Foundation proposal reviewer, January 2018
- Invited panelist for National Science Foundation proposal reviews, February 2017, September 2015, January 2015, May 2014, January 2013
- Advisor, White Mountain Science Institute, Mobile STEM Lab Project, 2016
- Faculty Fellow, Tisch College of Civic Life, 2016-17
- Board member, Engineering Research Interest Group, National Association for Research in Science Teaching (NARST), 2016 - 2018
- Steering committee member for the National Academy of Engineering *Engineer Girl* program
- Early Career Faculty Forum Speaker, National Association for Research in Science Teaching, April 2015
- Advisor for the WIPRO Science Education Fellowship Program, UMass Boston, 2014-16
- One-to-One iPad Implementation Pilot Project, College of Education and Human Development, UMass Boston, May 2014 - present
- Chair, Search Committee for COSMIC Postdoctoral Research Fellow, Aug. – Nov. 2013
- Co-coordinator, Annual Symposium on Teacher Education, 2012 – 2013. Collaborated with Dr. Jack Levy to organize and lead the University of Massachusetts Boston symposium on research/innovation in teacher education in May 2012 and May 2013.

Journal Peer Review

- *Cognition & Instruction; Journal of Engineering Education*; *Journal of Precollege Engineering Education Research*; *Science Education*; *International Journal of STEM Education*; *Journal of Research in Science Teaching*; *Instructional Science*; *Elementary School Journal*; *Science & Children*

Other Peer Review

- Conference proposal and paper reviewer, *American Society for Engineering Education Annual Conference and Exposition,* 2009, 2010, 2014, 2015, 2018
- Conference proposal reviewer, *American Educational Research Association* Annual Conference, 2014
- Conference proposal reviewer, *National Association for Research in Science Teaching* Annual Conference, 2011, 2012, 2016
- Engineering content reviewer, *Family Engineering Activities Guide*, Michigan Tech, May 2010
- Graduate student guest reviewer, *Gifted Child Quarterly*, May 2008

University and Departmental Committee Membership

- Outcomes and Assessment Committee, School of Engineering, January 2019 - present
- Search Committee for Mechanical Engineering Lecturer, Spring 2019
- Search Committee for Bridge Professor for the Tufts University Institute for Research on Learning and Instruction, 2018-19
- Search Committee for inaugural director of Tufts University Institute for Research on Learning and Instruction, 2017-18
- Search Committee for Professor of Mechanical Engineering Design, Tufts 2016-17
- Equal Educational Opportunity Committee, Tufts, 2016-17
- Technology Committee, College of Education and Human Development, Apr. – Dec. 2015
- Teacher Education Program Committee for the Curriculum & Instruction Department of the College of Education and Human Development, UMASS Boston, September 2011 – Dec. 2015
- Senate of the College of Education and Human Development, Jan. 2012 – May 2014
- Course Evaluation Committee for the College of Education and Human Development, UMASS Boston, February 2013 – November 2014
- Department Curriculum Committee for the Curriculum & Instruction Department of the College of Education and Human Development, UMASS Boston, September 2012 – May 2013
- Search Committee for Associate Project Director in COSMIC, UMASS Boston, 2013

- Search Committee for Professors of Electrical and Computer Engineering, UMASS Boston, 2013
- Search Committee for COSMIC Associate Director, UMASS Boston, 2013
- Search Committee for Lecturer in Mathematics/ESL Education, UMASS Boston, 2012
- Search Committee for Professor of Electrical Engineering, UMASS Boston, 2012

Other Service

- Learning Assistant program coordinator, Mechanical Engineering department, Spring 2018 and Spring 2019
- TA Assignment Coordinator, Mechanical Engineering department, Spring 2018
- Faculty Advisor, Tufts University School of Engineering freshmen bridge program (BEST), July 2016 - present
- Judge, National Academy of Engineering *Engineer Girl* essay contest, 2014, 2015, 2016
- Informal mentor for NSF CADRE Fellows program, 2014
- Guest commentator for online science education courses, Tufts Fulcrum Institute, 2009 - 2010
- Workshop facilitator, Campus Visiting Day for Boston Arts Academy Students, 2008 - 2011
- Workshop facilitator, ALERTA After-School Program, April 2013
- Workshop facilitator, Take Our Sons & Daughters to Work Day, UMASS Boston, April 2014

PROFESSIONAL SOCIETY MEMBERSHIPS

- International Society for the Learning Sciences, 2010 - present
- American Educational Research Association, 2008 - present
- National Science Teachers Association, 2006 - present
- American Society for Engineering Education, 2005 – present
- National Association for Research in Science Teaching (NARST), 2012 – present

---

LICENSURE

- Massachusetts Educator Licensure, Mathematics and Science Teaching, Grades 5-8 (Preliminary)