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Education

- 1995 Ph.D. Cornell University
Science Education, Curriculum and Instruction
Advisors: William S. Carlsen (principal), Kenneth Strike, George Posner

Dissertation: *The Effect of Teachers' Sociological Understanding of Science on Classroom Practice and Curriculum Innovation*
- 1991 B.A. & M.A. Yale University
Biology with Honors, summa cum laude

Professional Experience

- May 2019–present Professor of Practice in Education and Engineering
Founding Director, Youth Engineering Solutions (YES)
The Pennsylvania State University, University Park, PA
- May 2003–March 2019 Vice President
Founding Director, Engineering is Elementary (EiE)
Museum of Science, Boston, MA
Reached 20 million students and 200,000 educators
Secured \$30 million in grant funding
Generated \$50 million in revenue
- September 2001–May 2006 Director and Director of Engineering Education Research
Center for Engineering Educational Outreach
Tufts University, Medford, MA
- April 1998–December 2001 Project Director and Co-PI
Women's Experiences in College Engineering Project
Goodman Research Group, Inc., Cambridge, MA
- January 1997–January 2001 Research Associate, Science Education
Cornell University, Ithaca, NY
- August 1995–December 1997 Postdoctoral Fellow, Science Education
Cornell University, Ithaca, NY

Honors and Awards

Christine Cunningham

- Harold W. McGraw, Jr. Prize in Education, 2017
IEEE Pre-University Educator Award, 2015
American Society for Engineering Education K–12 and Pre-College Division Lifetime Achievement Award, 2015
International Society for Design and Development in Education Prize, 2014
American Society for Engineering Education Fellow, 2014
International Society for Design and Development in Education Fellow (ISDDE), 2010
Mary Margaret Scoby Award, Technology Education for Children Council, 2007
Leaders to Watch, International Technology and Engineering Educators Association, 2007

Epsilon Pi Tau, Exemplary Initiation, 2006
 Outstanding Leadership Award, American Society of Engineering Education K–12 Division, 2005
 College of Agriculture and Life Sciences Excellence in Extension/Outreach Award, Cornell University, 1999
 Marvin and Ruth Glock Dissertation Award, Cornell University, 1997
 American Educational Research Association Division K Dissertation Award, 1996
 National Association for Research in Science Teaching Dissertation Award, 1996
 Spencer Dissertation Fellowship, 1994–95
 Distinguished Service Award, Cornell University Student Life Union, 1993
 NSF Graduate Research Fellowship, 1991–94
 A.D. White Fellowship, Cornell University, 1991–94
 Alpheus Henry Snow Prize, Yale University, 1991
 Yale Science and Engineering Award, Yale University, 1991
 William R. Belknap Prize, Yale University, 1991
 John Spangler Nicholas Cup, Yale University, 1991
 Phi Beta Kappa, Yale University, Inducted 1989, President 1990–91

Engineering is Elementary

SIAA CODiE Award, Best PreK/Early Childhood Learning Solutions, Wee Engineer, 2019
Every Kid Can Engineer, NSF 2016 Video Showcase Public Choice & Presenters Choice Awards
Engineering is Elementary, NSF 2015 Video Showcase Public Choice & Presenters Choice Awards
 2015 Best Website for Teaching & Learning Award, American Association of School Librarians
 Readers' Choice Top 100 Product for 2014, District Administration magazine
 Top 100 Educational Innovations from Fundación Telefónica, 2014
Engineering is Everywhere Special Report: Ice Cream!, TELLY Bronze Award, Education Category, 2014
Engineering is Everywhere Special Report: Runoff!, TELLY Bronze Award, Education Category, 2014
Engineering is Everywhere Special Report: Insulation!, TELLY Bronze Award, Education Category, 2014
 Silicon Valley Education Fund Award, 2013
 Change the Equation STEMworks Program, 2012
 Change the Equation Featured Program, 2010
 Bayer Best Practice in K-12 STEM Education Program, 2010
Industrial Engineering: Making Work Easier, Platinum Award for General Video Production from the National Professional Videographers Association, 2006
Industrial Engineering: Making Work Easier, TELLY Award, Educational Video Production Category, 2006

Curricula

Youth Engineering Solutions (YES):

YES Elementary Units (2021):

Engineering Sun Hats (Kindergarten)
 Engineering Nightlights (Grade 1)
 Engineering Hand Pollinators (Grade 2)
 Engineering Magnetic Dog Doors (Grade 3)
 Engineering Safety Vests (Grade 4)
 Engineering Plastic Filters (Grade 5)

Story

Made for Shade
 A Bright Idea
 Be the Bee
 Opening Doors
 Get the Message Across
 The Problem with Plastics

YES Out of School Units (2021):

Engineering Sock Assistive Devices
 Engineering Rope Rescue Shuttles

Engineering is Elementary (EiE):

Curricular Units (2011):

A Sticky Situation: Designing Walls (*Materials Engineering*)
 Water, Water Everywhere: Designing Water Filters (*Environmental Engineering*)

Catching the Wind: Designing Windmills (*Mechanical Engineering*)
 To Get to the Other Side: Designing Bridges (*Civil Engineering*)
 Marvelous Machines: Making Work Easier (*Industrial Engineering*)
 The Best of Bugs: Designing Hand Pollinators (*Agricultural Engineering*)
 Sounds Like Fun: Seeing Animal Sounds (*Acoustical Engineering*)
 Just Passing Through: Designing Model Membranes (*Bioengineering*)
 An Alarming Idea: Designing Alarm Circuits (*Electrical Engineering*)
 A Work in Process: Improving a Play Dough Process (*Chemical Engineering*)
 A Stick in the Mud: Evaluating a Landscape (*Geotechnical Engineering*)
 The Attraction is Obvious: Designing Maglev Systems (*Transportation Engineering*)
 Thinking Inside the Box: Designing Plant Packages (*Packaging Engineering*)
 A Long Way Down: Designing Parachutes (*Aerospace Engineering*)
 Now You're Cooking: Designing Solar Ovens (*Green Engineering*)
 Solid as a Rock: Replicating an Artifact (*Materials Engineering*)
 Taking the Plunge: Designing Submersibles (*Ocean Engineering*)
 A Slick Solution: Cleaning an Oil Spill (*Environmental Engineering*)
 Lighten Up: Designing Lighting Systems (*Optical Engineering*)
 No Bones About It: Designing Knee Braces (*Biomedical Engineering*)

Storybooks:

Yi Min's Great Wall: A Materials Engineering Story (2005)
 Saving Salila's Turtle: An Environmental Engineering Story (2005)
 Leif Catches the Wind: A Mechanical Engineering Story (2005)
 Javier Builds a Bridge: A Civil Engineering Story (2005)
 Aisha Makes Work Easier: An Industrial Engineering Story (2005)
 Mariana Becomes a Butterfly: An Agricultural Engineering Story (2005)
 Kwame's Sound: An Acoustical Engineering Story (2005)
 Juan Daniel's Fútbol Frog: A Bioengineering Story (2006)
 A Reminder for Emily: An Electrical Engineering Story (2006)
 Michelle's MVP Award: A Chemical Engineering Story (2006)
 Suman Crosses the Karnali River: A Geotechnical Engineering Story (2007)
 Hikaru's Toy Trouble: A Transportation Engineering Story (2007)
 A Gift from Fadil: A Packaging Engineering Storybook (2007)
 Paulo's Parachute Mission: An Aerospace Engineering Story (2008)
 Lerato Cooks Up a Plan: A Green Engineering Story (2008)
 Galya and Natasha's Rocky Adventure: A Materials Engineering Story (2009)
 Despina Makes a Splash: An Ocean Engineering Story (2009)
 Tehya's Pollution Soluttion: An Environmental Engineering Story (2009)
 Omar's Time to Shine: An Optical Engineering Story (2010)
 Erik's Unexpected Twist: A Biomedical Engineering Story (2010)

Video: Industrial Engineering: Making Work Easier (In collaboration with DigiNovations)

Professional Development Guides:

Engineering is Elementary Professional Development Guides (2012):
 A Sticky Situation: Designing Walls
 Water, Water Everywhere: Designing Water Filters
 Catching the Wind: Designing Windmills
 To Get to the Other Side: Designing Bridges
 Marvelous Machines: Making Work Easier
 The Best of Bugs: Designing Hand Pollinators
 Sounds Like Fun: Seeing Animal Sounds
 Just Passing Through: Designing Model Membranes
 An Alarming Idea: Designing Alarm Circuits

A Work in Process: Improving a Play Dough Process
 A Stick in the Mud: Evaluating a Landscape
 The Attraction is Obvious: Designing Maglev Systems
 Thinking Inside the Box: Designing Plant Packages
 A Long Way Down: Designing Parachutes
 Now You're Cooking: Designing Solar Ovens
 Solid as a Rock: Replicating an Artifact
 Taking the Plunge: Designing Submersibles
 A Slick Solution: Cleaning an Oil Spill
 Lighten Up: Designing Lighting Systems
 No Bones About It: Designing Knee Braces

Engineering in Out-of-School Time Educator Workshop Professional Development Guide (2014)

Engineering Adventures:

Bubble Bonanza: Engineering Bubble Wands (2011)
 Hop to It: Safe Removal of Invasive Species (2012)
 Go Green: Engineering Recycled Racers (2012)
 Shake Things Up: Engineering Earthquake-Resistant Buildings (2012)
 To the Rescue: Engineering Aid Drop Packages (2012)
 Liftoff: Engineering Rockets and Rovers (2013)
 The Sky's the Limit: Engineering Flying Technology (2013)
 Music to My Ears: An Acoustical Engineering Challenge (2016)
 A Slippery Slope: Engineering an Avalanche Protection System (2016)
 Light Up the Night: An Electrical Engineering Challenge (2016)
 In Good Hands: Engineering Space Gloves (2018)

Engineering Everywhere:

Put a Lid on It: Engineering Safety Helmets (2013)
 Here Comes the Sun: Engineering Insulated Homes (2013)
 Don't Runoff: Engineering an Urban Landscape (2013)
 Food for Thought: Engineering Ice Cream (2013)
 Go Fish: Engineering Prosthetic Tails (2013)
 It's About Time: Engineering Timers (2013)
 Plants to Plastics: Engineering Bioplastics (2013)
 Outbreak Alert!: Engineering a Pandemic Response (2014)
 Growing Up: Engineering Vertical Farms (2014)
 It's in the Bag: Engineering Bioinspired Gear (2014)
 Testing the Waters: Engineering a Water Reuse Process (2017)
 Worlds Apart: Engineering Remote Sensing Devices (2017)

i2 Camp Curricula:

Global Architectural Design: A Green Engineering Challenge (2013)
 Redesigning the Urban Landscape: An Environmental Engineering Challenge (2013)
 Crash Test Engineering: A Biomedical Engineering Challenge (2013)
 Engineering Ice Cream: Designing Food Processes (2013)
 Engineering Prosthetic Devices: Biomechanical Engineering (2013)
 Tracking the Fourth Dimension: Engineering Timekeeping Devices (2013)
 Bioplastics: Chemical Engineering (2013)
 Outbreak Alert! Engineering a Pandemic Response: Biomedical Engineering (2013)
 Vertical Farming: Agricultural Engineering (2014)
 Bioinspired Textiles: Textile Engineering (2014)

Engineering is Elementary for Kindergarten:***Curricular Units:***

- Raising the Roof: Designing Shelters (2018)
- Here's the Scoop: Designing Trash Collectors (2018)

Storybooks:

- Protecting Penny (2018)
- Taking Out the Trash (2018)

Wee Engineer (2018) (Preschool Engineering)

Environmental Inquiry Series:

- Carlsen, W. S., Cunningham, C. M., Trautmann, N. M. & Krasny, M. E. (2003). *Watershed dynamics* (Student and teacher edition). Arlington, VA: National Science Teachers Association Press.
- Krasny, M. E., Trautmann, N. M., Carlsen, W. S., & Cunningham, C. M. (2003). *Invasion ecology* (Student and teacher edition). Arlington, VA: National Science Teachers Association Press.
- Trautmann, N. M., Krasny, M.E., Carlen, W. S., & Cunningham, C. M. (2003). *Decay and renewal* (Student and teacher edition). Arlington, VA: National Science Teachers Association Press.
- Trautmann, N. M., Carlsen, W. S., Krasny, M. E., & Cunningham, C. M. (2001). *Assessing toxic risk* (Student and teacher edition). Arlington, VA: National Science Teachers Association Press.

Book

Cunningham, C. M. (2018). *Engineering in elementary STEM education: Curriculum design, instruction, learning, and assessment*. New York, NY: Teachers College Press.

Journal Articles, Book Chapters, Invited Papers

- Cunningham, C. M., & Sneider, C. (in review). Precollege engineering education. In Lederman N., Zeidler, D., & Lederman, J. (Eds.), *Handbook of research in science education vol III*.
- Johnson, M., Kelly, G. K., & Cunningham, C. M. (in press). Failure and improvement in elementary engineering. *Journal of Research in STEM Education*.
- Cunningham, C. M., Wendell, K. B., & Bauer, D. (2021). Crosscutting concepts in engineering. In Nordine, J. & Lee, O. (Eds.), *Crosscutting concepts: Strengthening science and engineering learning*. (pp. 311–330). Arlington, VA: National Science Teachers Association Press.
- Cunningham, C. M., Kelly, G. J., & Meyer, N. (2021). Affordances of engineering with English learners. *Science Education*. 105, 255–280. DOI: 10.1002/sce.21606
- Laguzza, K., Katzer, K., McDonnell, M.E., & Cunningham, C. M. (2021). Engineering in preschool: Building the basis for lifelong problem solving. *Teaching Young Children*. 14(2), 12–16.
- Cunningham, C. M., Lachapelle, C. P., Brennan, R. T., Kelly, G. J., San Antonio Tunis, C., & Gentry, C. A. (2020). The impact of engineering curriculum design principles on elementary students' engineering and science learning. *Journal of Research in Science Teaching*. 57, 423–453. DOI: 10.1002/tea.21601
- Cunningham, C. M., & Kelly, G. J. (2019). Collective reasoning in elementary engineering education. In Manalo, E. (Ed.) *Deeper learning, dialogic learning, and critical thinking*. (pp. 339–355). New York, NY: Routledge.
- Kelly, G. J., & Cunningham, C. M. (2019). Epistemic tools in engineering design for K-12 education. *Science Education*. 103, 1080–1111. DOI: 10.1002/sce21513
- Garcia, M., Gentry, C., Jordan, E., Nolan, B., & Cunningham, C. M. (2019). A focus on function: An early childhood engineering activity helps students think about the way things work. *Science & Children*. 57(3), 73–77.

- San Antonio-Tunis, C., Berliner, O., & Cunningham, C. M. (2019). Streamlining differentiation & integration: Exploring a new educator resource. *The Elementary STEM Journal*, 23(3), 14–17.
- Lachapelle, C. P., Cunningham, C. M., & Oh, Y. (2019). What is technology? Development and evaluation of a simple instrument for measuring children’s conceptions of technology. *International Journal of Science Education*, 41(2), 188–209. DOI: 10.1080/09500693.2018.1545101
- National Academies of Sciences, Engineering, and Medicine [NASEM]. (2018) *English Learners in STEM Subjects: Transforming Classrooms, Schools, and Lives*. Washington, DC: National Academies Press. [Committee member who helped write the report]
- Cunningham, C. M., Lachapelle, C. P., & Davis, M. (2018). Engineering concepts, practices, and trajectories for early childhood education. In English, L. & Moore, T. (Eds.), *Early engineering learning* (pp. 135–174). New York, NY: Springer.
- Robinson, A., Adelson, J. L., Kidd, K. A., & Cunningham, C. M. (2017). A talent for tinkering: Developing talents in young, low-income children through engineering curriculum. *Gifted Child Quarterly*, 62(1), 130–144. DOI: 10.1177/0016986217738049
- Michael Pyryt Collaborative Research Award, American Educational Research Association, 2018
 - Senior Investigator Research Paper Award from the Mensa Foundation
- Davis, M. E., Cunningham, C. M., & Lachapelle, C. P. (2017). They can’t spell “engineering” but they can do it: Designing an engineering curriculum for the preschool classroom. *Zero to Three Journal*, 37(5), 4–12.
- Lachapelle, C. P., Cunningham, C. M., & Davis, M. (2017). Middle childhood education: Engineering concepts, practices, and trajectories. In deVries, M. J. (Ed.), *Handbook of technology education* (pp. 141–157). New York, NY: Springer. DOI: 10.1007/978-3-319-38889-2_23-1
- Cunningham, C. M., & Kelly, G. K. (2017). Epistemic practices of engineering for education. *Science Education*, 101, 486–505. DOI: 10.1002/sc.21271
- Cunningham, C. M., & Kelly, G. K. (2017). Framing engineering practices in elementary school classrooms. *International Journal of Engineering Education*, 33(1B), 295–307.
- Kelly, G. J., Cunningham, C. M., & Ricketts, A. (2017). Engaging in engineering practices as identity work through engineering practices in elementary classrooms. *Linguistics and Education*, 39, 48–59. DOI: 10.1016/j.linged.2017.05.003
- Hertel, J. D., Cunningham, C. M., & Kelly, G. K. (2017). The roles of engineering notebooks in shaping elementary engineering student discourse and practice. *International Journal of Science Education*, 39, 1194–1217. DOI: 10.1080/09500693.2017.1317864
- Cunningham, C. M. (2017). Engineering practices. In Schwarz, C., Passmore, C., & Reiser, B. (Eds.), *Helping students make sense of the world using Next Generation science and engineering practices* (pp. 283–307). Arlington, VA: National Science Teachers Association Press.
- Early Childhood STEM Working Group. (2017). Early STEM matters: Providing high-quality STEM experiences for all young learners. *Policy Report*.
- Cunningham, C. M., & Carlsen, W. S. (2016). Not just a prop for teaching science. *PRISM*, 26(3), 68.
- Cunningham, C. M. (2016). Engineering education for elementary students. In deVries, M. J., Gumaelius, L., & Skogh, I. B. (Eds.), *Pre-university engineering education* (pp. 81–99). Rotterdam, Netherlands: Sense Publishers. DOI 10.1007/978-94-6300-621-7_6
- Cunningham, C. M., & Higgins, M. (2016). Designing engineering experiences to engage *all* students. *Educational Designer*, 3(9). Retrieved from <http://www.educationaldesigner.org/ed/volume3/issue9/article31/index.htm>
- Cunningham, C. M. (2015). Turn school setbacks into success. *A parent’s guide to STEM*. (p. 40). U.S. News & World Report.

- Cunningham, C. M., & Higgins, M. (2014). Engineering for everyone. *Educational Leadership*, 72(4), 42–47.
- Cunningham, C. M., & Berger, C. (2014). Integrating science and engineering in the elementary classroom. In Yager, R. (Ed.), *Exemplary STEM programs: Designs for success* (pp. 423–440). Arlington, VA: National Science Teachers Association Press.
- Cunningham, C. M. (2014). Engineering is Elementary: Engineering for elementary school students (grades 1–5). In C. I. Sneider (Ed.), *The go-to guide for engineering curricula, preK-5!* (pp. 19–38). Thousand Oaks, CA: Corwin Press.
- Higgins, M., & Cunningham, C. M. (2014). Engineering Adventures: Engineering for out-of-school time. In C. I. Sneider (Ed.), *The go-to guide for engineering curricula, preK-5!* (pp. 147–162). Thousand Oaks, CA: Corwin Press.
- Cunningham, C. M., & Carlsen, W. S. (2014). Precollege engineering education. In N. Lederman (Ed.), *Handbook of research on science education, vol II* (pp. 747–758). Mahwah, NJ: Lawrence Erlbaum Associates, Publishers.
- Cunningham, C. M., & Lachapelle, C. P. (2014). Designing engineering experiences to engage *all* students. In S. Purzer, J. Strobel, & M. Cardella (Eds.), *Engineering in pre-college settings: Synthesizing research, policy, and practices* (pp. 117–142). Lafayette, IN: Purdue University Press.
- Lachapelle, C. P., & Cunningham, C. M. (2014). Engineering in elementary schools. In S. Purzer, J. Strobel, & M. Cardella (Eds.), *Engineering in pre-college settings: Synthesizing research, policy, and practices* (pp. 61–88). Lafayette, IN: Purdue University Press.
- Cunningham, C. M., & Carlsen, W. S. (2014). Teaching engineering practices. *Journal of Science Teacher Education*, 25(2), 197–210.
- Lachapelle, C. P., Sargianis, K., & Cunningham, C. M. (2013). Engineer it, learn it: Science and engineering practices in action. *Science and Children*, 51(3), 70–76.
- Sargianis, K., Lachapelle, C. P., Cunningham, C. M., Facchiano, J., Sanderson, C., & Slater, P. (2012). Limestone or wax? *Science and Children*, 50(4), 54–61.
- Morgan, E., Sargianis, K., Skophammer, R., Cunningham, C. M., Yocom de Romero, N., & Murphy-Garcia K. (2012). Engineering elementary students: Two examples of integrating science and engineering in the classroom. *Children's Technology and Engineering*, 11(2), 8–12.
- Cunningham, C. M. (2009). What's missing in K-12 education?: Answer—engineering and technology. *SouthEast Education Network*, 11(2), 30–31.
- Cunningham, C. M. (2009). Engineering is Elementary. *The Bridge*, 39(3), 11–17.
- Cunningham, C. M. (2008). Technology and engineering in museums. In R. L. Custer & T. L. Erikson (Eds.), *Engineering and Technology Education. 57th Yearbook* (pp. 208–210). Woodland Hills, CA: Glencoe/McGraw-Hill.
- Cunningham, C. M. (2007, October). *Elementary teacher professional development in engineering: Lessons learned from Engineering is Elementary*. Paper presented to National Academy of Engineering K-12 Engineering Committee.
- Cunningham, C. M., Knight, M. T., Carlsen, W. S., & Kelly, G. (2007). Integrating engineering in middle and high school classrooms. *International Journal of Engineering Education*, 23(1), 3–8.
- Bhargava, P., Antonakakis, J., Cunningham, C., & Zehnder, A. T. (2006). Web-based virtual torsion laboratory. *Computer Applications in Engineering Education*, 14(1), 1–8.
- Knight, M. T., Huttlinger, C., Carlson, B., & Cunningham, C. (2006). Engineering in the classroom: A low-tech, local approach. *Technology Teacher*, 66(2), 18–21.

- Single, P. B., Muller, C. B., Cunningham, C. M., Single, R. M., & Carlsen, W. S. (2005). MentorNet: E-Mentoring for women students in engineering and science. *Journal of Women and Minorities in Science and Engineering*, 11(3), 295–309.
- Knight, M. T., & Cunningham, C. M. (2004). Building a structure of support: An inside look at the structure of women in engineering programs. *Journal of Women and Minorities in Science and Engineering*, 10(1), 1–20.
- Goodman, I. F., Cunningham, C. M., Lachapelle, C., Thompson, M., Bittinger, K., Brennan, R. T. & Delci, M. (2002). *Final Report of the Women's Experiences in College Engineering (WECE) Project*. Goodman Research Group, Inc. Cambridge, MA <http://www.grginc.com>.
- Single, P., Muller, C. B., Cunningham, C. M., & Single, R. M. (2000). Electronic communities: A forum for supporting women professionals and students in technical and scientific fields. *Journal of Women and Minorities in Science and Engineering*, 6(2), 115–130.
- Trautmann, N. T., Carlsen, W. S., Krasny M. E., & Cunningham, C. M. (2000) Integrated inquiry. *Science and Children*, 67(6), 52–54.
- Cunningham, C. M. (1998). The effect of teachers' sociological understanding of science (SUS) on curricular innovation. *Research in Science Education*, 28(2), 243–257.
- Cunningham, C. M., & Helms, J. V. (1998). Sociology of science as a means to a more authentic, inclusive and liberatory science education. *Journal of Research in Science Teaching*, 35(5), 483–499.
- Cunningham, C. M. (1997). Who knows?: The influence of teachers' sociological understanding of science on knowledge, authority, and control in the classroom. *Journal of Classroom Interaction*, 32(2), 24–34.
- Carlsen, W. S., Kelly, G. J., & Cunningham, C. M. (1994). Teaching ChemCom: Can we use the text without being used by the text? In G. Aikenhead & J. Solomon (Eds.), *Science, technology, and society education* (pp. 84-96). New York, NY: Teachers College Press.
- Kelly, G. J., Carlsen, W. S., & Cunningham, C. M. (1993). Science education in sociocultural context: Perspectives from the sociology of science. *Science Education*, 77(2), 207–220.

Conference Proceedings (Peer-reviewed Papers)

- Cunningham, C. M., & Kelly, G. J., & Meyer, N. (2019, June). *Affordances of engineering for elementary-aged English Learners*. Paper presented at American Society of Engineering Education Annual Conference & Exposition, Tampa, Florida. <https://peer.asee.org/32048>
- San Antonio-Tunis, C., & Clark, J., & Cunningham, C. M., & Lachapelle, C. P. (2019, June). *Engineering interest and attitude development in out-of-school time*. Paper presented at the American Society of Engineering Education Annual Conference & Exposition, Tampa, Florida. <https://peer.asee.org/32728>
- Bloom, N. E., & Roberts, E., & Rubino-Hare, L., & Archer, H. N., & Cunningham, C. M., & Clark, J. (2019, June). *How educators implement engineering curricula in OST settings*. Paper presented at American Society of Engineering Education Annual Conference & Exposition, Tampa, Florida. <https://peer.asee.org/32894>
- Lachapelle, C. P. & Cunningham, C. M. (2019, June). *Measuring fidelity of implementation in a large-scale research study*. Paper presented at the American Society of Engineering Education Annual Conference & Exposition, Tampa, Florida. <https://peer.asee.org/33089>
- Lachapelle, C. P., & Cunningham, C. M. (2017, June). *Elementary engineering student interests and attitudes: A comparison across treatments*. Paper presented at the American Society for Engineering Education Annual Conference & Exposition, Columbus, OH. <https://peer.asee.org/28211>
- Hertel, J. D., Cunningham, C. M., Kelly, G. J., & Lachapelle, C. L. (2016, June). *The roles of engineering notebooks in shaping elementary engineering student discourse and practice*. Paper presented at the

American Society of Engineering Education Annual Conference & Exposition, New Orleans, LA.
<https://peer.asee.org/27014>

- Lachapelle, C. L., & Cunningham, C. M. (2016, June). *Performance assessment in elementary engineering: Evaluating student work*. Paper presented at the American Society of Engineering Education Annual Conference & Exposition, New Orleans, LA. <https://peer.asee.org/25884>
- Lachapelle, C. P., Oh, Y., Shams, M. F., Hertel, J. D., & Cunningham, C. M. (2015, June). *HLM modeling of pre/post-assessment results from a large-scale efficacy study of elementary engineering*. Paper presented at the American Society of Engineering Education Annual Conference & Exposition, Seattle, WA. <https://peer.asee.org/24185>
- Lachapelle, C. P., Hertel, J. D., Shams, M. F., San Antonio, C., & Cunningham, C. M. (2014, June). *The attitudes of elementary teachers towards elementary engineering*. Paper presented at the American Society of Engineering Education Annual Conference & Exposition, Indianapolis, IN. <https://peer.asee.org/23121>
- Heil, D. R., & Hutzler, N., & Cunningham, C. M., & Jackson, M., & Chadde, J. F. (2012, June). *Family Engineering: Exploring engineering with elementary-age children and their parents*. Paper presented at the American Society of Engineering Education ASEE Annual Conference & Exposition, San Antonio, Texas. <https://peer.asee.org/21393>
- Cunningham, C. M., & Lachapelle, C. P. (2012, June). *Engaging ALL students in engineering*. Paper presented at the American Society for Engineering Education Annual Conference & Exposition, San Antonio, TX. <https://peer.asee.org/21286>
- Sargianis, K., Yang, S., & Cunningham, C. M. (2012, June). *Effective engineering professional development for elementary educators*. Paper presented at the American Society for Engineering Education Annual Conference & Exposition, San Antonio, TX. <https://peer.asee.org/21261>
- Cunningham, C. M. (2011, June). *Making elementary engineering work: Lessons from partnerships and practice, Museum of Science*. Paper presented at the American Society for Engineering Education Annual Conference & Exposition, Vancouver, BC. <https://peer.asee.org/18315>
- Cunningham, C. M., & Lachapelle, C. P. (2010, June). *The impact of Engineering is Elementary (EiE) on students' attitudes toward engineering and science*. Paper presented at the American Society for Engineering Education Annual Conference & Exposition, Louisville, KY. <https://peer.asee.org/15989>
- Lachapelle, C. P., & Cunningham, C. M. (2010, June). *Assessing elementary students' understanding of engineering and technology concepts*. Paper presented at the American Society for Engineering Education Annual Conference & Exposition, Louisville, KY. <https://peer.asee.org/16257>
- Cunningham, C. (2008, June). *Elementary teacher professional development in engineering: Lessons learned from Engineering is Elementary*. Paper presented at American Society for Engineering Education Annual Conference & Exposition, Pittsburgh, Pennsylvania. <https://peer.asee.org/4414>
- Hotaling, L., & McGrath, B., & Shields, C., & McKay, M., & Lowes, S., & Cunningham, C., & Lachapelle, C., & Yao, S. (2007, June). *Engineering Our Future New Jersey*. Paper presented at American Society for Engineering Education Annual Conference & Exposition, Honolulu, Hawaii. <https://peer.asee.org/2231>
- Hester, K., & Cunningham, C. M. (2007, June). *Engineering is Elementary: An engineering and technology curriculum for children*. Paper presented at the American Society for Engineering Education Annual Conference & Exposition, Honolulu, HI. <https://peer.asee.org/1469>
- Cunningham, C. M., & Lachapelle, C. P. (2007, June). *Engineering is Elementary: Children's changing understandings of science and engineering*. Paper presented at the American Society for Engineering Education Annual Conference & Exposition, Honolulu, HI. <https://peer.asee.org/1470>
- Cunningham, C. M., Lachapelle, C. P., & Lindgren-Streicher, A. (2006, June). *Elementary teachers' understandings of engineering and technology*. Paper presented at the American Society for Engineering Education Annual Conference & Exposition, Chicago, Illinois. <https://peer.asee.org/200>

- Cunningham, C. M., Lachapelle, C. P., & Lindgren-Streicher, A. (2005, June). *Assessing elementary school students' conceptions of engineering and technology*. Paper presented at the American Society for Engineering Education Annual Conference & Exposition, Portland, OR. <https://peer.asee.org/14836>
- Faux, R., & Knight, M., & Gravel, B., & Cunningham, C. (2005, June). *Learning through teaching: A longitudinal study on the effects of GK-12 programs on teaching fellow*. Paper presented at the American Society for Engineering Education Annual Conference & Exposition, Portland, Oregon. <https://peer.asee.org/14854>
- Knight, M., & Cunningham, C. M. (2004, June). *Draw an Engineer Test (DAET): Development of a tool to investigate students' ideas about engineers and engineering*. Paper presented at the American Society for Engineering Education Annual Conference & Exposition, Salt Lake City, UT. <https://peer.asee.org/12831>
- Single, R. M., & Carlsen, W. S., & Cunningham, C. M., & Muller, C. B., & Single, P. B. (2002, June). *A three-year analysis of the benefits accrued by women engineering and science students who participate in a large-scale e-mentoring program*. Paper presented at the American Society of Engineering Education Annual Conference & Exposition, Montreal, Canada. <https://peer.asee.org/11295>
- Carlsen, W. S., & Cunningham, C. M., & Muller, C. B., & Single, P. B. (2001, June). *Electronic mentoring: Supporting women engineering and science student in the crucial early years of college*. Paper presented at the American Society of Engineering Education Annual Conference & Exposition, Albuquerque, New Mexico. <https://peer.asee.org/9173>

Editorials & Invited Blogs

- Cunningham, C. M. (2019, April 17). New directions for engineering education research—Building the K-12 agenda [Blog post]. Retrieved from <http://cadrek12.org/resources/blogs/new-directions-engineering-education-research—building-k-12-agenda>
- Cunningham, C.M. (2019, February 19). No, engineering isn't just about job creation. *Education Week*. [Editorial]. Retrieved from <https://www.edweek.org/ew/articles/2019/02/20/no-engineering-isnt-just-about-job-creation.html>
- Cunningham, C. M. (2019, January 8). Engineering English learners in K–12 engineering [Blog post]. Retrieved from <http://nstacomunities.org/blog/2019/01/08/engaging-english-learners-in-k-12-engineering/>

Recent Invited Talks, Keynotes, Webinars, Panels, Workshops

- Early Engineering. *Invited Presentation, STEMIEfest*. October 7, 2021.
- Engineering mindset as an equity strategy. *Invited Panelist, Moonshot Mindshift Virtual Capacity Building Institute, STEM Next*. July 14, 2021.
- Engineering for equity. *Invited Talk, EEK!, Boston University*. July 13, 2021.
- STEM education & engineering. *Presentation, "Ask a Scientist" Series, Asheville Museum of Science*. July 9, 2021.
- NAEP science results. *NAEP Science Twitter Chat*. June 29, 2021.
- Crosscutting concepts in engineering. *Crosscutting Concepts: A Professional Book Study for K-12 Educators Web Seminar, National Science Teaching Association*. May 27, 2021.
- Under the microscope: 2019 National Assessment of Educational Progress (NAEP) science results. *Presenter, National Assessment Governing Board and National Center for Educational Statistics Science Release Event*. May 25, 2021.
- Preparing the next generation for careers in STEM. *Panelist, Nevada Afterschool Showcase*. April 15, 2021.
- Engineering mindset. *Invited Webinar, South Dakota Afterschool Conference*. November 18, 2020.

- Engineering practices III. *Invited Webinar, Million Girls Moonshot Webinar Series, STEM Next*. November 10, 2020.
- Educating a next generation of problem solvers with engineering. *Keynote Speaker, STEM Conference 2020, Singapore*. Delivered remotely. November 4, 2020.
- Engineering practices II. *Invited Webinar, Million Girls Moonshot Webinar Series, STEM Next*. October 13, 2020.
- Engineering mindset. *Invited Panelist, Nebraska Afterschool Conference*. September 30, 2020.
- Engineering practices support equity I. *Invited Webinar, Million Girls Moonshot Webinar Series, STEM Next*. September 22, 2020.
- Engineering in early education. *Invited Presentation, STEMIEfest: Reimagined*. September 18, 2020.
- What is engineering mindset? *Invited Webinar, STEM Series, Georgia State Afterschool Network*. July 15, 2020.
- Nurturing an engineering mindset. *Invited Webinar, TechDev*. July 9, 2020.
- What is engineering mindset? *Invited Webinar, Million Girls Mentor Webinar Series, STEM Next*. May 20, 2020.
- Engineering equity in K12 STEM education. *Invited Webinar, McGraw Webinar Series, University of Pennsylvania*. Philadelphia, PA. February 20, 2020.
- Sustaining innovation in education. *Panelist, McGraw Prize-Penn PSE Partnership Launch Event, University of Pennsylvania*. Philadelphia, PA. February 13, 2020.
- Engineering equity: Designing experiences for all students. *Invited Talk, Seoul National University Joint Symposium, Seoul National University of Education*. Seoul, Korea. February 5, 2020.
- Why all children should study engineering before they can even spell it. *Invited Keynote, Korean Association for Science Education (KASE) Conference*. Seoul, Korea. Scheduled for February 6, 2020, conference postponed due to coronavirus. Delivered at Ewha Women's University, Seoul, Korea, February 4, 2020.
- Why all children should study engineering before they can even spell it: Emphasizing the E in early childhood and elementary STEM. *Invited Talk, Caruth Institute for Engineering Education, Southern Methodist University*. Dallas, TX. November 22, 2019.
- Can young children really learn to engineer? *Invited Talk, STEM Briefing Series, U.S. Department of Education*. Washington, DC. October 17, 2019.
- How to increase the engagement of underrepresented groups in engineering. *Invited Panelist, Inclusive Learning, Education and Workforce Development in Future Societies Symposium, Swedish Royal Academy of Engineering Sciences, the National Academy of Engineering, and the Embassy of Sweden*. Washington, DC. October 15, 2019.
- Educating a next generation of problem solvers with preK-12 engineering. *Invited Talk, Dean's Lecture Series, College of Education, Information and Technology, Long Island University*. Brookville, NY. October 10, 2019.
- Engineering equity: Designing experiences for all students. *Invited Talk, University of Santiago de Compostela*. Santiago de Compostela, Spain. September 12 & 13, 2019.
- English learners in STEM subjects. *Panelist, National Science Teachers Association, STEM Forum & Expo*. San Francisco, CA. June 24 & 25, 2019.
- P-12 engineering education symposium. *Participant, Advancing Excellence in P-12 Engineering Education (AEEE)*. Baltimore, MD. June 5–7, 2019
- English learners in STEM subjects: Contemporary approaches to classroom instruction. *NSTA Virtual Conference*. May 4, 2019.

- Engineering pathways to problem solving. *Keynote Speaker, Ventura County PreK-12 STEAM Symposium*. Camarillo, CA. March 8, 2019.
- Elementary engineering. *Invited Workshop, Michigan Mathematics and Science Centers Network*. Grand Rapids, MI. February 28, 2019.
- Engaging families and community panel for *English Learners in STEM Subjects: Transforming Classrooms, Schools, and Lives* report. *Panel Moderator, National Academies*. Washington, DC. February 12, 2019.
- Interdisciplinary (STEM) learning and research in the 21st century: A conversation among scholars. *Invited Panelist, STEM Education Summit, University of California, Santa Barbara*. Santa Barbara, CA. February 7, 2019.
- The gateway to STEM and Engineering is Elementary. *Invited Speaker, STEM Education Summit, Aalborg University, Copenhagen Campus*. Copenhagen, Denmark. November 26, 2018.
- Integrating STEM into elementary classrooms. *Invited Speaker, Elementary STEM Leadership Seminar, Merrimack College*. North Andover, MA. October 25, 2018.
- Best practices in engineering teaching and outreach. *Invited Panelist, NSF Research Experience for Teacher Leveraging our Collective Impact Conference*. Raleigh, NC. October 23, 2018.
- Engineering equity: Designing experiences for *all* students. *Invited Speaker, Alliance for Diversity in Science and Engineering, Northeastern University*. Boston, MA. August 29, 2018.
- How engineering develops “habits of mind” that empower student performance. *Keynote Lecture, STEM Institute, New York City Department of Education Office of Curriculum, Instruction, and Professional Learning*. New York City, NY. August 7, 2018.
- Say “yes” to engineering education: Overcoming six common fears. *Video Conversation, LinkEngineering*. May 15, 2018.
- Everyone can engineer: Why all kids should study engineering—Even before they can spell it. *Keynote Speaker, Big Bang Conference*. Odense, Denmark. April 5, 2018.
- Girls + STEM = Powerful Opportunities. *Invited Speaker, Girls in STEM Luncheon, Maranyundo Initiative*. Boston, MA. December 14, 2017.
- Why all kids should study engineering—Even before they can spell it. *Keynote Speaker, University of North Carolina at Greensboro STEM Teacher Leader Collaborative Leadership Lab*. Greensboro, NC. November 6, 2017.
- How classroom engineering develops “habits of mind” that empower student performance. *Plenary Speaker, Thailand Institute for the Promotion of Teaching Science and Technology (IPST) Conference*. Videotalk. October 14, 2017.
- The formative years. *Speaker and Panelist, AtlanticLIVE Cracking the Code: The Next Generation of Women in STEM*. Boston, MA. September 29, 2017.
- The practice perspective. *Panelist, National Academy of Science Stakeholder Convening on Early Science, Technology, Engineering, and Mathematics Learning and Young Dual Language Learners*. Washington DC. May 24–25, 2017.
- Engineering design processes. *Invited Speaker, STEM Ecosystems Community of Practice Convening*. Tampa, FL. April 26, 2017.
- Diverse implementations of PreK-12 engineering education. *Panelist, National Academy of Engineering Educator Capacity Workshop*. Washington DC. April 19, 2017.
- Preparing girls for the digital age. *Panelist, Miss Hall’s School Education Forum*. New York, NY. April 10, 2017.
- Novel innovations in engineering education. *Panelist, Engineering Deans Institute*. Tampa, FL. April 3, 2017.

- Everyone can engineer: Why all kids should study engineering—Even before they can spell it. *Invited Speaker, STEM Teacher Leader Summit, University of North Carolina, Greensboro*. Greensboro, NC. March 14, 2017.
- Engineering 3-D learning: How engineering develops “habits of mind” that empower student performance. *Invited Speaker, Alabama Science Teachers Association*. Birmingham, AL. March 8, 2017.
- Everyone can engineer: Why all kids should study engineering—Even before they can spell it. *Invited Speaker, Pub Science, Discovery Space*. State College, PA. March 2, 2017.
- Renewing and repurposing preK-16 curriculum, instruction, and assessment—NGSS challenges and opportunities. *Invited Panelist, Waterbury Lecture, Pennsylvania State University*. State College, PA. November 29, 2016.
- Everyone can engineer: Why all kids should study engineering—Even before they can spell it. *Invited Speaker, Center for Science Teaching & Learning Seminar Series in STEM Education, Northern Arizona University*. Flagstaff, AZ. May 6, 2016.
- Integrate to innovate: How classroom engineering develops “habits of mind” that empower student performance. *Mary C. McCurdy Lecture, National Science Teacher Association Conference on Science Education*. Nashville, TN. March 31, 2016.
- Engineering. *Elementary NGSS Twitter Chat*. February 4, 2016.
- Engineering EiE®: The development of an elementary engineering curriculum. *Invited Lecture, University of California, Santa Barbara School of Education*. Santa Barbara, CA. January 14, 2016.
- Engineering education for the early childhood classroom. *Educare Ounce of Prevention Webinar, Erikson Institute*. January 12, 2016.
- Engineering habits of mind. *California Afterschool Network STEM Committee Webinar*. December 11, 2015.
- Early childhood engineering: Why kids should be making technologies, not just using them. *Invited Speaker, Early Education and Technology for Children Conference*. Orlando, FL. November 18, 2015.
- Everyone can engineer: Why all kids should study engineering—Even before they can spell it. *Focus Speaker, California Science Education Conference*. Sacramento, CA. October 3, 2015.
- Engineering EiE®: The development of an elementary engineering curriculum. *Keynote Lecture, International Society for Design and Development in Education*. Boulder, CO. September 22, 2015.
- Everyone can engineer: Why all kids should study engineering—Even before they can spell it. *Keynote Lecture, Spring STEM Institute, New York City Department of Education Office of Curriculum, Instruction, and Professional Learning*. New York City, NY. April 7, 2015.
- Unleashing curiosity through engineering. *Keynote Lecture, CA STEM Summit 2015*. Los Angeles, CA. March 16, 2015.
- Everyone can engineer: Why all kids should study engineering—Even before they can spell it. *Keynote Lecture, IEEE Integrated STEM Education Conference (ISEC)*. Princeton, NJ. March 7, 2015.
- What does engineering look like when done by K-12 students? *Speaker, Texas Teachers Summit*. College Station, TX. January 30, 2015.
- Engineering EiE: The research behind an exemplary elementary engineering curriculum. *Distinguished Lecture, Institute for Engineering Education and Innovation, Texas A&M*. College Station, TX. January 29, 2015.
- Why kids should study engineering before they can spell it. *Keynote Lecture, Pennsylvania Science Teachers Association Annual Conference*. State College, PA. December 3, 2014.
- Engineering is for elementary students: Why kids should study engineering before they can spell it. *Texas Tech University Seminar*. Lubbock, TX. November 17, 2014.

- The keys to success in K-6 NGSS implementation: Well-prepared teachers, excellent programs. *California State University Webinar*. November 14, 2014.
- Little kids can engineer: Outreach to elementary-school students. *Society of Women Engineers Voices from the Field Webinar Series*. August 27, 2014.
- What does engineering look like when done by K-12 students? *Keynote Lecture, National Academy of Engineering Guiding Implementation of K-12 Engineering Education Regional Meetings*. Washington, DC, June 30, 2014; Minneapolis, MN, August 12, 2014; Los Angeles, CA, November 4, 2014.
- Are you ready for the Next Generation? How a new approach to K-12 education will develop college-ready students with engineering habits of mind. *Distinguished Lecture, American Society for Engineering Education Annual Conference*. Indianapolis, IN. June 18, 2014.
- Engineering education for the Next Generation. *Keynote Lecture, STEM in Education Conference Keynote*. Dominguez Hills, CA. June 7, 2014.
- Engineering education for the Next Generation. *Keynote Lecture, Wake County Elementary STEM Education Day*. Raleigh, NC. May 8, 2014.
- Engineering education for the Next Generation. *Keynote Lecture, National Science Education Leadership Association*. Boston, MA. April 2, 2014.
- They can't spell "engineering," but they can do it: Young learners develop 21st century "habits of mind" with hands-on engineering activities. *Keynote Lecture, Vermont Kindergarten Conference*. Burlington, VT. March 28, 2014.
- Teaching NGSS engineering design through media for elementary school teachers. *WGBH Webinar Series*. January 27, 2014.
- Visualizing K-6 engineering education. *National Science Teachers Association Webinar Series*. September 18, 25, and October 2, 2013.
- Visualizing elementary engineering. *Keynote Lecture, Triangle Coalition Conference*. Washington DC. September 12, 2013.
- Engineering is Elementary: Engineering our future. *STEM Congressional Briefing: Harnessing the power of engineering to improve STEM education in K-12 schools*. Washington DC. June 12, 2013.
- Visualizing K-8 engineering education. *National Science Teachers Association Webinar Series*. May 16, 23, and 30, 2013.
- Putting the E in STEM. *Lehigh University College of Education Distinguished Lecture Series: Leaders of Practice: Transforming STEM: From global agenda to classroom success*. Lehigh, PA. February 5, 2013.
- Engineering education for the Next Generation. *Keynote Lecture, Wisconsin Project Lead the Way Professional Development Conference*. Milwaukee, WI. December 4, 2012.
- Engineering enhanced science, inquiry, and problem solving. *Keynote Lecture, National Science Teacher Association Regional Conference, Louisville*. Louisville, KY. October 18, 2012.
- Designing engineering experiences to engage ALL students. *Keynote Lecture, Minnesota STEM Education Conference*. Minneapolis, MN. May 17, 2012.
- Engineering is Elementary: Fostering children's problem solving, inquiry, and innovation. *Invited Talk, University of California, Santa Cruz*. Santa Cruz, CA. April 13, 2012.
- Engineering is Elementary: Teacher education. *National Academy of Engineering Integrated STEM Committee Presentation: Approaches to integrated STEM: Teacher education*. Washington DC. January 12, 2012.
- Engineering is Elementary: Fostering children's problem solving, inquiry, and innovation. *Invited Talk, Pennsylvania State University*. State College, PA. October 26, 2011.

- Serving as an effective STEM ambassador. *Plenary Speaker, Grand Challenge Summit, AZ Science Foundation.* Flagstaff, AZ. May 21, 2011.
- Why engineering K12 education for Alabama? *Invited Speaker, Alabama Science Teachers Association.* Dec 8, 2010.
- Engineering is Elementary: Engineering education for ALL children. *Invited Talk, American Association for the Advancement of Science.* Washington, DC. November 18, 2010.
- Engineering is Elementary. *Panel Member, National Research Council Pedagogical Dimensions of Computational Thinking Workshop: Computational Thinking in Engineering and Computer Science.* Washington, DC. February 4, 2010
- Engineering for elementary children!?!: Engaging *all* students through Engineering is Elementary. *Invited Talk, Oregon State University.* Corvallis, OR. May 14, 2009
- State of elementary science. *Congressional STEM Caucus.* Washington, DC. September 24, 2008.
- Elementary teacher professional development in engineering: Lessons learned from Engineering is Elementary. *National Academy of Engineering K-12 Engineering Committee Presentation: Engineering Education in Grades K-5.* Washington, DC. October 22, 2007.
- Engineering for elementary children. *Invited Talk, Purdue University.* West Lafayette, IN. March 30, 2007
- Engineering is Elementary: Engineering and technology lessons for children. *Invited Presentation and Teacher Workshop, Intel Thailand.* Bangkok, Thailand. Aug 25, 2006.
- Engineering for elementary children. *Keynote Speaker, Virginia Children's Engineering Convention.* February 24, 2006.

Media Appearances

- STEM Everyday #67: Dr. Christine Cunningham, EiE founder and director. *STEM Everyday* Podcast. June 13, 2017. <http://remarkablechatter.com/stem-everyday-67-dr-christine-cunningham-eie-founder-director/?platform=hootsuite>
- Engineering is Elementary founder Christine Cunningham speaks on K-12 engineering curriculum, equal access to STEM education. *Edtechtimes* Interview. April 13, 2017. <https://edtechtimes.com/2017/04/13/engineering-is-elementary-founder-christine-cunningham-speaks-on-k-12-engineering-curriculum-equal-access-to-stem-education/>
- The right way to teach science. WGBH *Innovation Hub* Radio Interview. July 25, 2014. <http://blogs.wgbh.org/innovation-hub/2014/7/25/right-way-teach-science/>
- Engineering for kids. *How on Earth*, WGNU, Denver, CO Radio Interview. November 26, 2013.
- Engineering for kids. Fox 25, Boston Television Interview. November 19, 2013.

Funded Projects

- Youth Engineering Solutions: Middle Schoolers Solve Engineering Problems Using Computational Thinking (YES MS):* MathWorks Inc., \$4,400,000, August 2021–July 2025 (PI, Grant Author)
- Youth Engineering Solutions: Engineering Opportunities in Out-of-School Programs for English Learners (YES OS):* National Science Foundation Broadening Participation in Engineering & Engineering Education, \$697,965, April 2021–September 2023 (PI, Grant Author)
- EiE Family Resources for Engineering:* Overdeck Foundation, \$315,775, November 2018–December 2019. (PI, Grant Author)
- Engaging Elementary Students in Engineering: A Dell–EiE Collaboration:* Dell Giving, \$896,818, August 2018–July 2019 (Co-PI, Grant Co-Author)

- Engineering is Elementary in Boston Catholic Schools*: Lynch Foundation, \$300,381, July 2018–June 2022 (Co-PI, Grant Author)
- Engineering is Elementary in Orlando, FL*: Oracle, \$25,000, February 2018–March 2019 (PI, Co-Grant Author)
- Engaging Elementary Students in Engineering: A Dell–EiE Collaboration*: Dell Giving, \$1,003,943, June 2017–July 2018 (PI, Grant Co-Author)
- AIR Worldwide EiE Scholarship Program III*: AIR Worldwide, \$15,000, July 2017–June 2018 (PI)
- MathWorks EiE Scholarship Program*: MathWorks, \$23,000, April 2017–December 2017 (PI, Grant Co-Author)
- Engineering is Elementary in Orlando, FL*: Oracle, \$25,000, April 2017–March 2018 (PI, Grant Author)
- AIR Worldwide EiE Scholarship Program II*: AIR Worldwide, \$15,000, July 2016–June 2017 (PI)
- Expanding Access to Elementary Engineering through Online Professional Development Resources for Teachers*: Cisco, \$125,000, April 2016–August 2017 (PI, Grant Author)
- MathWorks EiE Scholarship Program*: MathWorks, \$23,000, April 2016–December 2016 (PI, Co-Grant Author)
- Engineering is Elementary in Baltimore, MD*: amazon.com through Change the Equation, \$5,000, March 2016–September 2016 (PI)
- EMC EiE Scholarship Program*: EMC, \$10,000, April 2016–December 2016 (PI, Co-Grant Author)
- Engineering is Elementary in Orlando, FL*: Oracle, \$25,000, April 2016–March 2017 (PI, Grant Author)
- 100kin10 Teach for America EiE Scholarship*: 100kin10, \$25,000, March 2016–September 2016 (Co-PI, Grant Author)
- PLANETS (Planetary Learning that Advances the Nexus of Engineering, Technology, and Science)*: NASA, \$4,923,480, January 2016–December 2020 (Co-PI, Grant Co-Author)
- AIR Worldwide EiE Scholarship Program*: AIR Worldwide, \$15,000, September 2015–June 2015 (PI, Grant Author)
- Engineering Adventures, Massachusetts Scholarships II*: SheGives, \$37,000, June 2015–December 2015 (PI, Grant Author)
- Building Pathways for Future Leaders in Engineering*: Gordon Foundation, \$5,000,000, June 2015–June 2020 (Co-PI, Grant Co-Author)
- Engineering is Elementary in Massachusetts*: Oracle, \$25,000, April 2015–March 2016 (PI, Grant Author)
- PictureSTEM*: National Science Foundation iCorps-L, \$50,000, December 2014–March 2015 (Project Mentor)
- Engineering Adventures, Massachusetts Scholarships*: SheGives, \$33,500, June 2014–December 2014 (PI, Grant Author)
- Engineering is Elementary in Silicon Valley*: Oracle, \$25,000, February 2014–October 2014 (PI, Grant Author)
- Engineering is Elementary in Silicon Valley*: Silicon Valley Education Fund, \$5,000, October 2013–August 2014 (PI, Grant Author)
- Engineering and NGSS Media Project*: Raytheon, \$4,200, September 2013–January 2014 (Co-PI, Grant Author)
- Engineering for All*: National Science Foundation Discovery Research K-12, \$633,800, September 2013–August 2016 (Co-PI, Grant Co-Author)
- Middle School Camps and OST Curriculum Development*: i2Camps, \$500,000, November 2012–January 2015 (PI, Grant Co-Author)

- Exploring the Efficacy of Engineering is Elementary*: National Science Foundation Discovery Research K-12, \$2,999,822, September 2012–August 2016 (PI, Grant Author)
- Engineering MISSION: Engineering for Middle School Science, Inspiration, and Opportunity*: NASA, \$857,125, June 2012–June 2015 (Grant Co-Author)
- Engineering is Elementary in Saudi Arabia*: Raytheon, \$254,970, August 2012–August 2014 (PI, Grant Author)
- Engineering Adventures Pilot in Orange County*: Samueli Foundation, \$5,975; 2011–2012 (Co-PI)
- Engineering Adventures: Curriculum Development*: S.D. Bechtel Jr. Foundation, \$500,000; November 2011–January 2013 (PI, Grant Author)
- Engineering is Elementary: Supporting Implementation with Video Resources*: Cognizant, \$750,000; 2011–2014 (PI, Grant Author)
- Developing Partner Sites*: Cognizant, \$60,000; 2011–2014 (PI, Grant Author)
- The Raytheon Partnership for Engineering is Elementary Teacher Professional Development*: Raytheon, \$600,000; 2011–2016 (PI, Grant Author)
- Raytheon-EiE Teacher Scholarship Program*: Raytheon, \$1,000,000; 2011–2015 (PI, Grant Author)
- Bridging Engineering, Science, and Technology (BEST) for Elementary Educators*: National Science Foundation Advanced Technological Education; \$899,072, June 2010–May 2014 (PI, Grant Author)
- Engineering is Elementary: Resources for Classroom Implementation and Dissemination*: S. D. Bechtel, Jr. Foundation: \$310,770; 2010–2012 (PI, Grant Author)
- Engineering is Elementary (EiE) Out-of-School Time (OST) Proof of Concept Grant*: S. D. Bechtel, Jr. Foundation: \$175,142; 2010–2011 (PI, Grant Author)
- EiE in Oakland After-School Programs: An Evaluation and Planning and Pilot for EiE Afterschool Modules*: S. D. Bechtel Jr. Foundation; \$73,000, 2010 (PI, Grant Author)
- Engineering is Elementary*: Tides Foundation/Google Charitable Trust: \$135,000; 2010–2011 (PI, Grant Author)
- Engineering is Elementary: Alliance for Curriculum Implementation and Support*: Cargill Foundation, \$2,483,526; January 2009–June 2013 (Co-PI, Grant Co-Author)
- Engineering is Elementary: National Dissemination through Regional Partners*: S.D. Bechtel, Jr. Foundation: \$466,000; 2009–2010 (PI, Grant Author)
- Family Engineering for Parents & Elementary-Aged Children*: National Science Foundation Informal Science Education, \$1,697,484; May 2008–April 2011 (Co-PI, Grant Co-Author)
- Connecting Mathematics, Science, Engineering, Classrooms, and Museums*: Liberty Museum Foundation, \$1,000,000; January 2008–December 2012 (PI, Grant Author)
- Engineering is Elementary: National Research and Professional Development*: S.D. Bechtel, Jr. Foundation: \$150,000; 2007–2008 (PI, Grant Author)
- Engineering is Elementary*: Cisco Systems Foundation, \$250,000; 2008-2009 (PI, Grant Author)
- Advancing Technological Skills and Literacy (ATLAS) of Elementary Educators*: National Science Foundation Advanced Technological Education, \$740,649; July 2007–June 2010 (PI, Grant Author)
- EiE MA Dissemination*: Cisco Systems Foundation, \$52,362; 2007–2008 (PI, Grant Author)
- EiE Webspaces*: Cisco Systems Foundation, \$46,200; 2006–2007 (PI, Grant Author)
- Engineering is Elementary National Dissemination*: NIST, \$210,000; 2005–2007 (PI, Grant Author)
- Engineering is Elementary: Engineering and Technology Lessons for Children*: National Science Foundation Instructional Materials Development, \$2,725,620; June 2005–May 2011 (PI, Grant Author)

- Engineering is Elementary Educational Public Video Pilot Project*: Intel, \$38,628; 2005 (PI, Grant Author)
- Power Up! Creating Leaders for Community College & High School Technology/Engineering*: National Science Foundation Advanced Technological Education, \$772,534; July 2004–June 2008 (PI, Grant Author)
- EiE Curriculum*: Millipore, \$20,000; October 2004–December 2005 (PI, Grant Author)
- EiE Curriculum*: Hewlett Packard, \$25,000; October 2004–December 2005 (PI, Grant Author)
- K-6 Technology/Engineering Tie-In Lessons*; Massachusetts Pipeline Fund, \$100,000; June 2004–May 2005 (PI, Grant Author)
- Creating Exhibitions for Everyone—A Research Project Planning Grant*: National Science Foundation Informal Science Education, \$49,982; May 2004–January 2005 (PI, Grant Author)
- Engineering is Elementary: Engineering and Technology Lessons for Children*; Intel, \$225,889; 2004–2005 (PI, Grant Author)
- Supplemental Funding Request for K-8 Engineering Dissemination through FOSS Technology Tie-In Lessons*; Intel, \$60,000; 2003–2004 (PI, Grant Author)
- K-8 Engineering Dissemination through FOSS Technology Tie-In Lessons*; Intel, \$60,000; 2003–2004 (PI, Grant Author)
- Tufts Engineering the Next Steps (TENS) Research Experience for Teachers*: National Science Foundation GK-12, \$65,871; July 2003–June 2004 (PI, Grant Author)
- Tufts Engineering the Next Steps (TENS) GK12 Project*: National Science Foundation GK-12; \$1,547,795, June 2003–May 2006 (PI, Grant Author)
- Leveraging Experience to Accelerate Progress (LEAP): Moving Towards Gender Equity in Engineering Education*: Intel Foundation, GE, Mobil Exxon, HP, \$90,000; Sept 2002–February 2003 (PI, Grant Author)
- Pre-College Engineering for Teachers (PCET)*: National Science Foundation Teacher Enhancement, \$1,738,421; August 2002–December 2008 (PI, Grant Author)
- Tufts Computer Science, Engineering, and Mathematics Scholarship Program*: National Science Foundation Division of Undergraduate Education, \$385,000; September 2002–August 2006 (Co-Author, Evaluator)
- Cornell University Sciences Research Partnerships (CERP)*: National Science Foundation GK-12, \$1,350,000; February 2000–August 2003 (Co-PI, Grant Co-Author)
- Urban Ecosystems Modeling: Preservice and Inservice Teacher Education through Technology-Intensive Curriculum Design*: Dwight D. Eisenhower Competitive Inservice Training Grant for Science and Mathematics Education, \$116,000; 1999–2001 (PI, Grant Author)
- A Comprehensive Evaluation of Women in Engineering Programs*: National Science Foundation Research on Educational Policy and Practice, Sloan Foundation, \$1,200,000; March 1998–December 2001 (Co-PI, Project Director)
- Environmental Inquiry: Learning Science as Science is Practiced*: National Science Foundation Instructional Materials Development, \$845,000; January 1997–December 2001 (Co-PI, Grant Co-Author)
- Institute on Science and the Environment for Teachers*: National Science Foundation Teacher Enhancement 1995-2000 \$694,693; Dwight D. Eisenhower Competitive Inservice Training Grant for Science and Mathematics Education; \$67,500 (1993), \$70,875 (1994), \$42,500 (1995), \$33,000 (1996), \$33,000 (1997), \$33,000 (1998); (Project Director, Grant Co-Author)
- Invisible College for Science Education Reform*: NYNEX \$20,000; August 1996–July 1997 (Project Director, Grant Author)

Memberships and Committees

Current Advisory Committees and Service:

Chair; National Academy of Engineering Committee “Inclusive, Diverse, Equitable Engineering for All” (2021–present)
 Member (Curriculum Specialist); National Assessment Governing Board (2020–present)
 EngineerGirl Steering Committee and Essay Contest Judge; National Academy of Engineering (2014–present)
 Investigating Black Youths’ Engineering, Innovation, and Design Practices at the Intersection of Museum and Home/Family Learning; CAREER grant, Dr. DeLeon Tolbert Smith, University of Michigan, Dearborn (2021–present)
 Pennsylvania STEM Program Development Committee, PSU 4H (2021–present)
 Facilitator/K-8 Subject Matter Expert, A Multi-society approach to K–8 STEM Education; American Society of Mechanical Engineers (2021–present)
 Planetary Learning that Advances the Nexus of Engineering, Technology, and Science (PLANETS); Northern Arizona University (2021–present)
 STEM+C2; University of Arkansas, Little Rock (2019–present)
 Million Girls Moonshoot; STEM Next Opportunity Fund (2019–present)
 STEM Innovation for Inclusion in Early Education (STEMIIEE); University of North Carolina and University of Denver (2018–present)
 Mentor, Doctoral Mentoring Collective; STEMIIEE (2020–present)
 Ed+gineering Partnership; Old Dominion University (2019–present)
 NGSS-aligned Museum-based Engineering Education Program with Classroom Extensions; University of California, Santa Barbara and MOXI (2018–present)

Previous Advisory Committees and Service:

Engineering for Equity; TERC (2019–2021)
 Mentor, EngineerGirl Ambassador Program; National Academy of Engineering (2020–2021)
 Super Duper Molly Cooper; Silvergate Media (2018–2021)
 Consultant, Mazie’s Amazing Machines (2021)
 Designing our Tomorrow; Oregon Museum of Science and Industry (2018–2021)
 External Reviewer, Engineering Education Kits! (EEK!), Boston University (2021)
 Notre Dame Center for STEM Education; Notre Dame (2014–2021)
 P12 Engineering Standards Subcommittee of American Society of Engineering Education Committee on P12 Engineering Education (2019–2020)
 Monkey with a Toolbelt; Silvergate Media (2018–2020)
 Broadening Identities for Diverse Youth in STEM through Socioenvironmental Problem Solving; University of North Carolina at Greensboro (2017–2020)
 National Academy of Science Committee “Supporting English Learners in STEM Subjects” (2017–2019)
 Engineering in School; Danish Academy of Technical Sciences (2017–2019)
 NSF Nanosystems Engineering Research Center for Directed Multiscale Metamaterials with Nanoscale Precision (CELL-MET); Boston University (2017–2019)
 STEMStarters+; University of Arkansas, Little Rock (2016–2018)
 Journal of Pre-College Engineering Education Research (J-PEER) Editorial Board (2010–2019)
 Co-Creating a Research Agenda to Evaluate University Ambassador Programs’ Impact on Engineering Identity of K-12 Students Steering Committee; Boston University (2018–2020)
 Summit for Examining the Potential of Crosscutting Concepts to Support Three-Dimensional Learning; University of Virginia (2018)
 National Academy of Engineering Committee “Guiding Implementation of K-12 Engineering Education in the United States” (LinkEngineering) (2104–2018)
 Power of Data; Northern Arizona University (2105–2018)
 Broadening Contexts to Motivate Participation in Engineering CAREER Grant; Purdue University (2015–2018)
 Wise Guys and Gals – Boys & Girls as WISEngineering STEM Learners; Hofstra University (2014–2018)

Engineering Education Research and Innovation Impact Summit; Purdue University (2018)
 Engineering Teacher Pedagogy: Using INSPIRES to Support Integration of Engineering Design in Science and Technology Classrooms; University of Maryland Baltimore County (2015–2018)
 Head Start on Engineering: Supporting Engineering Interest Development in Early Childhood; Oregon Museum of Science and Industry (2015–2018)
 Engineering for All; Hofstra University (2013–2017)
 Carnegie Corporation of New York Instructional Materials and Next Generation Science Standards Convening (2017)
 STEMStarters+; University of Arkansas (2015–2017)
 Early Childhood STEM Working Group; Erikson Institute and University of Chicago Center for Elementary Mathematics Education (2015–present)
 Interdisciplinary Project-Based Learning Grade 1 Planning Grant; University of Michigan (2015–2016)
 National Assessment of Educational Progress Technology and Engineering Literacy Group Leader for Building TEL from a Foundation of Contextual Data Event (2016)
 White House Early STEM Learning Symposium (2016)
 NSF – Next Generation Tools to Analyze and Revise Science Curriculum; California State University, East Bay (2015–2016)
 ATETV presents SciTrends; Pellet Productions (2014–2016)
 Designing Our World: A Community Envisioning Girls as Engineers; Oregon Museum of Science and Industry (2013)
 California Science Curriculum Framework Review (2014–2015)
 National Science Foundation iCorps-L Mentor; Purdue University (2014–2015)
 White House – UMBC College Opportunity STEM Education Workshop (2014)
 National Assessment of Educational Progress Technology and Engineering Literacy Achievement Levels Description Content Expert Panel; WestEd (2014)
 An Examination of Science and Technology Teachers’ Conceptual Learning through Concept-Based Engineering Professional Development (Project INFUSE); Black Hills State University (2011–13)
 UTeach Engineering: Training Secondary Teachers to Deliver Design-Based Instruction; University of Texas at Austin (2010–11)
 Partnership to Improve Student Achievement Physical Science: Integrated STEM approaches (PISA²); Steven Institute of Technology (2010–2014)
 Crossing Boundaries and Exploring Biodiversity Conservation Using Information Technologies; Hobart and William Smith College (2009–2013)
 Engaging Youth in Engineering Module Study (EYE); Mobile Area Education Foundation (2009–2013)
 An Investigation of the Impact of Strengthening the “T” and “E” Components of STEM in High School Biology and Chemistry Courses (2009–2014)
 Assessing Women and Men in Engineering; Pennsylvania State University (2009)
 National Academy of Engineering Committee “K-12 Engineering Education Standards” (2008–2010)
 STEM Conference National Steering Committee (2008)
 Engineering Equity Extension Service; National Academy of Sciences (2008–2010)
 Institute for P-12 Engineering Research and Learning (INSPIRE); Purdue University (2007–2014)
 Peer Alliance for Gender Equity; Science Museum of Minnesota (PAGE) (2007–2010)
 Pulse of the Planet Kids Science Challenge; Jim Metzner Productions Inc (2007–2011)
 Commonwealth Alliance for Information Technology Education; University of Minnesota – Twin Cities (2007–2009)
 Chair, American Society of Engineering Education K-12 and Pre-College Division (2006–7)
 Engineering Research Center for Compact and Efficient Fluid Power; University of Massachusetts, Amherst (2006–2010)
 Engineering our Future New Jersey (2006–2009)
 Brookline High School 21st Century Fund (2006–2007)
 A National Symposium to Develop an Effective Model for the Professional Development of K-12 Engineering and Technology Education Teachers; Illinois State University (2005–7)

National Center for Engineering and Technology Education (NCETE), Advisory Board Chair; Utah State University (2004–2010)
 Selection Committee, Women to Watch; Mass High Tech (2004–2009)
 Massachusetts Grade 5 Science and Technology/Engineering Assessment Development Committee (2004–5)
 Program Chair, American Society of Engineering Education K-12 and Pre-College Division (2003–2004)
 MentorNet, A National Electronic Industrial Mentoring Network for Women in Engineering and Science; MentorNet (2000–2008)

Reviewer:

Cultural Studies of Science Education
 International Journal of Science Education
 Journal of Engineering Education
 Journal of Research in Science Teaching
 Journal of Teacher Education
 Journal of Pre-College Engineering Education Research
 Science Education
 Science & Education
 National Science Foundation

Academic Degree Committees:

Phillip Lau, Tufts University, M.S. in Engineering, 2002
 Christine Shaw, Northeastern University, Ph.D. in Law and Public Policy, 2012
 Matthew Johnson, Pennsylvania State University, Ph.D. in Education, 2016
 Amanda Sullivan, Tufts University, Ph.D. in Early Childhood Development, 2016
 Carmen Vanderhoof, Pennsylvania State University, Ph.D. in Education, 2019

Program Evaluation

External Evaluator for Community-Based Engineering Design Challenges for English Learners, Utah State University (2015)
 Program Evaluator for Multi-Threaded Instruction: Forming Multi-Disciplinary Research Groups to Improve Undergraduate Education, Tufts University (2003)
 Program Evaluator for Tufts Computer Science, Engineering, and Mathematics Scholarship Program, Tufts University (2003)
 External Evaluator for Virtual Labs, Real Data, Including Biological Materials for Statics and Mechanics of Materials, Cornell University (2002)
 Program Evaluator for Student Teacher Outreach and Mentorship Program, Tufts University (2002)
 Program Evaluator for GK-12 Program, Tufts University (2002)
 External Evaluator for GE Fund Faculty for the Future Program Support, WEPAN (2001)
 External Evaluator for the National Junior Science & Humanities Symposium, Academy of Applied Sciences (2001)
 External Evaluator for MentorNet: The Electronic Industrial Mentoring Program for Women in Engineering and Science (1998)
 External Evaluator for the Center for Economic and Environmental Development, Allegheny College (1997)
 Program Evaluator for the COSMOS Corporation (1997)
 External Evaluator for the Engineering Concepts for the High School Classroom Replication Project: Partners for Engineering Problem Solving, Dartmouth College (1997)
 External Evaluator for the Engineering Concepts for the High School Classroom, Dartmouth College (1996)
 External Evaluator for the French Creek Environmental Education Project, Allegheny College (1995)
 External Evaluator for the Women in Science Project, Dartmouth College (1994)