

ELIZABETH A. DAVIS

University of Michigan
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Ann Arbor, MI 48109-1259
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ACADEMIC POSITIONS

2015 TO PRESENT PROFESSOR, UNIVERSITY OF MICHIGAN
Professor in Science Education program within Educational Studies unit of the School of Education.

2010 TO 2014 CHAIR OF ELEMENTARY TEACHER EDUCATION, UNIVERSITY OF MICHIGAN
Faculty chair of elementary teacher education program in the School of Education.

2006 TO 2015 ASSOCIATE PROFESSOR, UNIVERSITY OF MICHIGAN
Associate professor in Science Education program within Educational Studies unit of the School of Education.

1998 TO 2006 ASSISTANT PROFESSOR, UNIVERSITY OF MICHIGAN
Assistant professor in Science Education program within Educational Studies unit of the School of Education.

EDUCATION

UNIVERSITY OF CALIFORNIA AT BERKELEY
Ph.D. in Education in Mathematics, Science, and Technology (in the Cognition and Development area), 1998.
Dissertation: "Scaffolding Students' Reflection for Science Learning"
Committee Members: Marcia Linn (Chair), Barbara White, Michael Clancy

UNIVERSITY OF CALIFORNIA AT BERKELEY
M.A. in Education in Mathematics, Science, and Technology, 1994.
Thesis: "Using Parentheses and Quotes in LISP"
Thesis Advisors: Marcia Linn, Michael Clancy

PRINCETON UNIVERSITY
B.S.E. in Engineering and Management Systems (in the Civil Engineering and Operations Research department), 1989.
Thesis: "Image Processing in Human and Computer Systems"
Thesis Advisor: Alain Kornhauser

FUNDING, HONORS, AND AWARDS

HONORS AND AWARDS

PRESIDENTIAL EARLY CAREER AWARD FOR SCIENTISTS AND ENGINEERS (PECASE)
WHITE HOUSE, JULY 2002

The highest honor bestowed by the US government on early-career scientists and engineers.

COMPUTERWORLD HONORS PROGRAM LAUREATE JANUARY 2003
Award to projects that use technology in innovative ways to benefit the world.

AERA DIVISION C JAN HAWKINS AWARD APRIL 2004
Award for humanistic research in learning technologies.

CLASS OF 1923 TEACHING AWARD AT UNIVERSITY OF MICHIGAN APRIL 2004
Award for excellence in teaching in the School of Education.

PATTISHALL AWARD AT UNIVERSITY OF MICHIGAN OCTOBER 2009
Award for excellence in research in the School of Education.

PHI KAPPA PHI, ACADEMIC HONOR SOCIETY MARCH 2015
Inducted into the nation's oldest and most selective collegiate honor society for all academic disciplines.

ONGOING GRANTS, FUNDING, PROJECTS, AND CENTERS

National Science Foundation DRK-12 Award to PIs James Spillane and Don Peurach
Next Generation Science Standards (NGSS) and Designing School System Educational
Infrastructure to Support Elementary School Science Instruction
(funding began August 1, 2018; \$1,499,628 over five years; co-PI)

Carnegie Corporation of New York award to PI Danny Edelson
OpenSciEd: Next Generation Open Source Science Instructional Materials
(funding began 2018; design team chair for educative curriculum materials, with Kate McNeill)

Spencer Foundation Lyle Spencer Research Award
Using Multiple Lenses to Investigate the Development of Content Knowledge and Teaching
Practices in Relationship to Learning Opportunities
(funding began September 1, 2015; \$921,070 over four years; PI with co-PI Annemarie Palincsar)

Gates Foundation award to TeachingWorks with PI Deborah Ball
Teacher Preparation Transformation Centers Initiative (The Centers Project)
(funding began 2015; science education lead faculty)

Lucas Foundation award to PI Joe Krajcik, co-PI Annemarie Palincsar, and co-PI Emily Miller
Using Multiple Literacies in Project Based Learning
(funding began 2015; senior consultant)

Gates Foundation award to Pam Grossman and Morva McDonald
Core Practices Consortium
(funding began 2013; science education lead researcher)

COMPLETED GRANTS, FUNDING, PROJECTS, AND CENTERS

National Science Foundation REESE Award
Elementary Educative Curriculum Materials for Teachers of Science (ELECTS)
(funding began September 1, 2010; \$1,488,398 over three years; PI with co-PIs Annemarie
Palincsar and Sean Smith)

National Science Foundation Instructional Materials Development
Modeling Designs for Learning Science (MoDeLS)
(co-PI; funding began October 2006; full award \$1,738,829)

National Science Foundation Center for Learning and Teaching
The Center for Curriculum Materials in Science (CCMS)
(member of leadership team, as of September 1, 2003)

University of Michigan Center for Research on Learning and Teaching
Faculty Development Fund
Fostering Pedagogical Reasoning in Prospective Elementary Teachers
(co-PI; funding began January 1, 2002; \$10,000)

University of Michigan Rackham / CARAT Research Fellowship
CASES Development Plan
(PI; funding began January 1, 2002; \$12,000 for stipend for graduate student researcher)

National Science Foundation Early Career Award
CAREER: Making a Case for New Elementary Science Teachers (CASES)
(PI; funding began September 1, 2001; \$723,676 over five years)

National Science Foundation Information Technology Research Grant
The Engineering of Scaffolded Work Environments
(senior personnel; funding began September 1, 2000; \$2,999,998 over three years)

University of Michigan Horace Rackham Grant and Fellowship
Investigating the Learning of New Elementary Science Teachers
(PI; funding began January 31, 2000; \$7998 as grant, \$7000 as fellowship)

REFEREED JOURNAL ARTICLES

* indicates co-author was current or former student

** indicates co-author was current or former post-doctoral fellow

Kademian, S.*, & Davis, E. A. (2018). Supporting beginning teacher planning of investigation-based science discussions. *Journal of Science Teacher Education*, 29(8), 712-740. doi: 10.1080/1046560X.2018.1504266

Davis, E. A., Palincsar, A. S., Smith, P. S., Arias, A. M.*, & Kademian, S. M.* (2017). Educative curriculum materials: Uptake, impact, and implications for research and design. *Educational Researcher*, 46(6), 293-304. doi:https://doi-org.proxy.lib.umich.edu/10.3102/0013189X17727502

Benedict-Chambers, A.*, Kademian, S.*, Davis, E. A., & Palincsar, A. S. (2017). Guiding students towards sensemaking: Teacher questions focused on integrating scientific practices with science content. *International Journal of Science Education*, 39(15), 1977-2001. doi:10.1080/09500693.2017.1366674

Arias, A.*, & Davis, E. A. (2017). Supporting children to construct evidence-based claims in science: Individual learning trajectories in a practice-based program. *Teaching and Teacher Education*, 66, 204-218.

Davis, E. A., Kloser, M., Wells, A., Windschitl, M., Carlson, J., & Marino, J.-C.* (2017). Teaching the practice of leading sensemaking discussions in science: Science teacher educators using rehearsals. *Journal of Science Teacher Education*, 28(3), 275-293.

Kademian, S.*, Arias, A.*, Davis, E. A., & Palincsar, A. S. (2017). Supporting the use of scientific language: Teachers' use of content-foregrounded educative features. *Journal of Science Teacher Education*, 28(2), 146-168.

Arias, A.*, Smith, P. S., Davis, E. A., Marino, J.-C.*, & Palincsar, A. S. (2017). Justifying predictions: Connecting use of educative curriculum materials to students' engagement in science argumentation. *Journal of Science Teacher Education*, 28(1), 11-35.

Arias, A. M.*, Davis, E. A., Marino, J.-C.*, Kademian, S.*, & Palincsar, A. S. (2016). Teachers' use of educative curriculum materials to engage students in science practices. *International Journal of Science Education*, 38(9), 1504-1526. doi:http://dx.doi.org/10.1080/09500693.2016.1198059.

Davis, E. A., Janssen, F., & Van Driel, J. (2016). Teachers and science curriculum materials: Where we are and where we need to go. *Studies in Science Education*, 52(2), 127-160. (Authors are listed alphabetically.) DOI: 10.1080/03057267.2016.1161701

Arias, A.*, Bismack, A.*, Davis, E. A., & Palincsar, A. S. (2016). Interacting with a suite of educative features: Elementary science teachers' use of educative curriculum materials. *Journal of Research in Science Teaching*, 53(3), 422-449. [Paper was nominated for the National Science Teachers' Association's "Research Worth Reading" award.]

Bismack, A. S.*, Arias, A.*, Davis, E. A., & Palincsar, A. S. (2015). Examining student work for evidence of teacher uptake of educative curriculum materials. *Journal of Research in Science Teaching*, 52(6), 816-846.

Arias, A.*, Palincsar, A. S., & Davis, E. A. (2015). The design and use of educative curricular supports for text-based discussions in science. *Journal of Education*, 195(1), 21-35.

Bismack, A. S.*, Arias, A. M.*, Davis, E. A., & Palincsar, A. S. (2014). Connecting curriculum materials and teachers: Elementary science teachers' enactment of a reform-based curricular unit. *Journal of Science Teacher Education*, 25(4), 489-512.

Davis, E. A., Palincsar, A. S., Arias, A. *, Bismack, A. *, Marulis, L. *, & Iwashyna, S. * (2014). Designing educative curriculum materials: A theoretically and empirically driven process. *Harvard Educational Review*, 84(1), 24-52.

Forbes, C. *, & Davis, E. A. (2012). Operationalizing identity in action: A comparative study of direct versus probabilistic measures of curricular role identity for science teaching. *International Journal of Science and Mathematics Education*, 10(2), 267-292.

Beyer, C. *, & Davis, E. A. (2012). Developing preservice elementary teachers' pedagogical design capacity for reform-based curriculum design. *Curriculum Inquiry*, 42(3), 386-413.

Beyer, C. *, & Davis, E. A. (2012). Learning to critique and adapt science curriculum materials: Examining the development of preservice elementary teachers' pedagogical content knowledge. *Science Education*, 96(1), 130-157.

Bamberger, Y. **, & Davis, E. A. (2011). Middle-school science students' scientific modelling performances across content areas and within a learning progression. *International Journal of Science Education*, DOI:10.1080/09500693.2011.624133.

Nelson, M. *, & Davis, E. A. (2011). Preservice elementary teachers' evaluations of elementary students' scientific models: An aspect of pedagogical content knowledge for scientific modeling. *International Journal of Science Education*. DOI:10.1080/09500693.2011.594103.

Davis, E. A., Beyer, C. *, Forbes, C. *, & Stevens, S. ** (2011). Understanding pedagogical design capacity through teachers' narratives. *Teaching and Teacher Education*, 27(4), 797-810.

Kenyon, L., Davis, E. A., & Hug, B. (2011). Design approaches to support teachers in modeling practices. *Journal of Science Teacher Education*, 22(1), 1-21.

Forbes, C. *, & Davis, E. A. (2010). Curriculum design for inquiry: Preservice elementary teachers' mobilization and adaptation of science curriculum materials. *Journal of Research in Science Teaching*, 47(7), 820-839.

Forbes, C. *, & Davis, E. A. (2010). Beginning elementary teachers' beliefs about the use of anchoring questions in science: A longitudinal study. *Science Education*, 94(2), 365-387.

Beyer, C. *, & Davis, E. A. (2009). Supporting preservice elementary teachers' critique and adaptation of science curricula using educative curriculum materials. *Journal of Science Teacher Education*, 20(6), 517-536.

Beyer, C. *, & Davis, E. A. (2009). Using educative curriculum materials to support preservice elementary teachers' curricular planning: A comparison between two different forms of support. *Curriculum Inquiry*, 39(5), 679-703.

Beyer, C. *, Delgado, C. *, Davis, E. A., & Krajcik, J. (2009). Investigating teacher learning supports in high school biology curricular programs to inform the design of educative curriculum materials. *Journal of Research in Science Teaching*, 46(9), 977-998.

Schwarz, C. V., Reiser, B. J., Davis, E. A., Kenyon, L., Acher, A., Fortus, D., et al. (2009). Developing a learning progression of scientific modeling: Making scientific modeling accessible and meaningful for learners. *Journal of Research in Science Teaching*, 46(6), 632-654.

Davis, E. A., & Smithey, J. * (2009). Beginning teachers moving toward effective elementary science teaching. *Science Education*, 93(4), 745-770.

Dietz, C.*, & Davis, E. A. (2009). Preservice elementary teachers' reflection on narrative images of inquiry. *Journal of Science Teacher Education*, 20(3), 219-243.

Forbes, C.*, & Davis, E. A. (2008). The development of preservice elementary teachers' curricular role identity for science teaching. *Science Education*, 92(5), 909-940.

Forbes, C.*, & Davis, E. A. (2008). Exploring preservice elementary teachers' critique and adaptation of science curriculum materials in respect to socioscientific issues. *Science and Education*, 17(8-9), 829-854.

Beyer, C.*, & Davis, E. A. (2008). Fostering second-graders' scientific explanations: A beginning elementary teacher's knowledge, beliefs, and practice. *The Journal of the Learning Sciences*, 17(3), 381-414.

Davis, E. A., Petish, D.*, & Smithey, J.* (2006). Challenges new science teachers face. *Review of Educational Research*, 76(4), 607-651.

Davis, E. A. (2006). Characterizing productive reflection among preservice elementary teachers: Seeing what matters. *Teaching and Teacher Education*, 22(3), 281-301.

Davis, E. A. (2006). Preservice elementary teachers' critique of instructional materials for science. *Science Education*, 90(2), 348-375.

Davis, E. A., & Petish, D.* (2005). Real-world applications and instructional representations among prospective elementary science teachers. *Journal of Science Teacher Education*, 16(4), 263-286.

Davis, E. A., & Krajcik, J. (2005). Designing educative curriculum materials to promote teacher learning. *Educational Researcher*, 34(3), 3-14.

Davis, E. A. (2004). Knowledge integration in science teaching: Analyzing teachers' knowledge development. *Research in Science Education*, 34(1), 21-53.

Quintana, C., Reiser, B., Davis, E. A., Krajcik, J., Fretz, E.*, Duncan, R.G., et al. (2004). A scaffolding design framework for software to support science inquiry. *The Journal of the Learning Sciences*, 13(3), 337-386. (The writing was shared by the first three authors.)

Davis, E. A. (2003). Prompting middle school science students for productive reflection: Generic and directed prompts. *The Journal of the Learning Sciences*, 12(1), 91-142.

Davis, E. A. (2003). Untangling dimensions of students' beliefs about scientific knowledge and science learning. *International Journal of Science Education*, 25(4), 439-468.

Fretz, E.*, Wu, H.-K.*, Zhang, B.*, Davis, E. A., Krajcik, J., & Soloway, E. (2002). An investigation of software scaffolds supporting modeling practices. *Research in Science Education*, 32, 567-2002.

Davis, E. A., & Linn, M. C. (2000). Scaffolding students' knowledge integration: Prompts for reflection in KIE. *International Journal of Science Education*, 22(8), 819-837.

Davis, E. A., Linn, M. C., & Clancy, M. J. (1995). Learning to use parentheses and quotes in LISP. *Computer Science Education*, 6(1).

Davis, E. A., Linn, M. C., & Clancy, M. J. (1995). Students' off-line and on-line experiences. *Journal of Educational Computing Research*, 12(2).

JOURNAL EDITING

Associate Editor, *Journal of Research in Science Teaching*. (January 2020 to present.) Editors are Troy Sadler and Felicia Moore Mensah.

Co-Editor, with Joanne F. Carlisle, Edward A. Silver, Karen Wixson, and Addison Stone (at different times), *Elementary School Journal*. (May 2008 to May 2012.)

Davis, E. A., & Miyake, N. (Eds.). (2004). A special issue on scaffolding. *The Journal of the Learning Sciences*. This special issue includes the following introduction:

Davis, E. A., & Miyake, N. *Explorations of scaffolding in complex classroom systems*.

BOOKS, BOOK CHAPTERS, AND BOOK REVIEWS

* indicates co-author was current or former student

** indicates co-author was current or former post-doctoral fellow

Davis, E. A. & Marino, J.-C. (accepted). Practice-based elementary science teacher education. In D. Stroupe, K. Hammerness, & S. McDonald (Eds.), *Working title: Preparing science teachers through practice-based teacher education*. Harvard Education Press.

Davis, E. A., Zembal-Saul, C., & Kademian, S. M. (Eds.) (2020). *Sensemaking in Elementary Science: Supporting Teacher Learning*. Routledge. This edited book includes the following chapters, among others:

Davis, E. A., Zembal-Saul, C., & Kademian, S. M., *Introduction*.

Kademian, S. M., & Davis, E. A., *Planning and Enacting Investigation-based Science Discussions: Designing Tools to Support Teacher Knowledge for Science Teaching*

Davis, E. A., Palincsar, A. M., & Kademian, S. M., *Designing a practice-based elementary teacher education program and supporting professional learning in science teaching*

Davis, E. A., *Approximations of practice in science methods: A form of scaffolding for preservice elementary teachers*

Kelley-Petersen, M., Davis, E. A., Ghouseini, H., Kloser, M., & Monte-Sano, C. (2018). Rehearsals as examples of approximation. In P. Grossman (Ed.), *Teaching core practices in teacher education*. Cambridge, MA: Harvard Education Press. (Authors after the first author are listed in alphabetical order and contributed equally to the writing of the chapter.)

National Academies of Sciences Engineering and Medicine. (2018). *Design, Selection, and Implementation of Instructional Materials for the Next Generation Science Standards: Proceedings of a Workshop*. Washington, DC: The National Academies Press. (Member of the planning committee.)

Davis, E. A. (2016). Evolving goals, practices, and identities as an elementary science teacher educator: Prioritizing practice. In G. Buck & V. Akerson (Eds.), *Allowing our professional knowledge of pre-service science teacher education to be enhanced by self-study research: Turning a critical eye on our practice* (pp. 151-176). Switzerland: Springer International Publishing.

National Academies of Sciences, Engineering, and Medicine. (2015). *Science teachers' learning: Enhancing opportunities, creating supportive contexts*. Committee on Strengthening Science Education through a Teacher Learning Continuum. Board on Science Education and Teacher Advisory Council, Division of Behavioral and Social Science and Education. Washington, DC: The National Academies Press. (Member of the committee.)

Davis, E. A. (2015). Scaffolding learning. In R. Gunstone (Ed.), *Encyclopedia of Science Education*. Berlin Heidelberg: SpringerReference (www.springerreference.com) Springer-Verlag. Available at <http://www.springerreference.com/docs/html/chapterdbid/303058.html>.

Fishman, B., Davis, E. A., & Chan, C. (2014). A learning sciences perspective on teacher learning. In R. K. Sawyer (Ed.), *Cambridge Handbook of the Learning Sciences* (2nd ed.). New York: Cambridge University Press.

- Forbes, C. *, & Davis, E. A. (2010). Beginning elementary teachers' curriculum design and development of pedagogical design capacity for science teaching: A longitudinal study. In L. E. Kattington (Ed.), *Handbook of Curriculum Development* (pp. 209-232). New York: Nova Science Publishers.
- Davis, E. A., & Varma, K. (2008). Supporting teachers in productive adaptation. In Y. Kali, M. C. Linn & J. E. Roseman (Eds.), *Designing coherent science education* (pp. 94-122). New York: Teachers College Press.
- Linn, M. C., Kali, Y., Davis, E. A., & Horwitz, P. (2008). Policies to promote coherence. In Y. Kali, M. C. Linn & J. E. Roseman (Eds.), *Designing coherent science education* (pp. 201-210). New York: Teachers College Press.
- Davis, E. A. (2008). Book review. *International Journal of Science Education*, 30(8), 1129-1133.
- Fishman, B., & Davis, E. A. (2006). Teacher learning research and the learning sciences. In R. K. Sawyer (Ed.), *Cambridge Handbook of the Learning Sciences* (pp. 535-550). New York: Cambridge University Press.
- Linn, M. C., Davis, E. A., & Bell, P. (Eds.). (2004). *Internet Environments for Science Education*. Mahwah, NJ: Lawrence Erlbaum Associates. See <http://www.internetscienceeducation.org/>. This edited book includes the following chapters, among others:
- Davis, E. A. *Creating critique projects*. (p. 89-113)
 - Linn, M. C., Davis, E. A., & Bell, P. *Introduction*. (p. xv-xxviii)
 - Linn, M. C., Davis, E. A., & Bell, P. *Inquiry and technology*. (p. 3-27)
 - Linn, M. C., Eylon, B.-S., & Davis, E. A. *The knowledge integration perspective on learning*. (p. 29-46)
 - Linn, M. C., Davis, E. A., & Eylon, B.-S. *The scaffolded knowledge integration framework for instruction*. (p. 47-72)
 - Linn, M. C., Bell, P., & Davis, E. A. *Specific design principles: Elaborating the scaffolded knowledge integration framework*. (p. 315-339)
 - Linn, M. C., Davis, E. A., Bell, P., & Eylon, B.-S. *Closing thoughts: Internet environments for science education*. (p. 341-351)

REFEREED CONFERENCE PROCEEDINGS

* indicates co-author was current or former student

** indicates co-author was current or former post-doctoral fellow

- Arias, A. *, Davis, E. A., & Palincsar, A. S. (2014). Using educative curriculum materials to support teachers in engaging students to justify predictions. In J. Polman, E. Kyza, K. O'Neill, I. Tabak, W. Penuel, S. Jurow, K. O'Connor, T. Lee & L. D'Amico (Eds.), *The International Conference of the Learning Sciences 2014* (Vol. 3, pp. 1429-1431). Boulder, CO: International Society of the Learning Sciences.
- Davis, E. A. (2008). Elementary teachers' ideas about effective science teaching: A longitudinal study. In *International perspectives in the learning sciences: Creating a learning world. Proceedings of the Eight International Conference of the Learning Sciences - ICLS 2008*. Utrecht, the Netherlands: International Society of the Learning Sciences.
- Beyer, C. *, & Davis, E. A. (2006). Characterizing the quality of second-graders' observations and explanations to inform the design of educative curriculum materials. In S. Barab, K. Hay & D. Hickey (Eds.), *The Proceedings of the 7th International Conference of the Learning Sciences* (pp. 43-49). Mahwah, NJ: Lawrence Erlbaum Associates.
- Davis, E. A., Smithey, J. *, & Petish, D. * (2004). Designing an online learning environment for new elementary science teachers: Supports for learning to teach. In Y. B. Kafai, W. A. Sandoval, N. Enyedy, A. S. Nixon & F. Herrera (Eds.), *Proceedings of the 6th International Conference of the Learning Sciences, ICLS2004*. Mahwah, NJ: Lawrence Erlbaum Assoc.

Smithey, J.*, & Davis, E. A. (2004). Preservice elementary science teachers' identity development: Identifying with particular images of inquiry. In Y. B. Kafai, W. A. Sandoval, N. Enyedy, A. S. Nixon & F. Herrera (Eds.), *Proceedings of the 6th International Conference of the Learning Sciences, ICLS2004*. Mahwah, NJ: Lawrence Erlbaum Assoc.

Davis, E. A. (2002). Scaffolding prospective elementary teachers in critiquing and refining instructional materials for science. In P. Bell, R. Stevens & T. Satwicz (Eds.), *Proceedings of the Fifth International Conference of the Learning Sciences (ICLS)*. Seattle, WA: Lawrence Erlbaum.

Quintana, C., Reiser, B., Davis, E. A., Krajcik, J., Golan, R., Kyza, E., Edelson, D., & Soloway, E. (2002). Evolving a scaffolding design framework for designing educational software. In P. Bell, R. Stevens & T. Satwicz (Eds.), *Proceedings of the Fifth International Conference of the Learning Sciences (ICLS)*. Seattle, WA: Lawrence Erlbaum.

Smithey, J.*, & Davis, E. A. (2002). Preservice elementary science teachers' distributed expertise in an online community of practice. In P. Bell, R. Stevens & T. Satwicz (Eds.), *Proceedings of the Fifth International Conference of the Learning Sciences (ICLS)*. Seattle, WA: Lawrence Erlbaum.

Bell, P., & Davis, E. A. (2000). Designing Mildred: Scaffolding students' reflection and argumentation using a cognitive software guide. In B. Fishman & S. O'Connor-Divelbiss (Eds.), *Proceedings of the International Conference for the Learning Sciences 2000*. Mahwah, NJ: Lawrence Erlbaum Associates. Available at <http://www.umich.edu/~icls/proceedings/>.

Bell, P., Davis, E. A., & Linn, M. C. (1995). The Knowledge Integration Environment: Theory and design. In J. L. Schnase & E. L. Cunnius (Eds.), *Proceedings of the Computer Supported Collaborative Learning Conference '95*. Mahwah, NJ: Lawrence Erlbaum Associates. Available at <http://www.kie.berkeley.edu/KIE/info/publications/theory&design.html>.

Davis, E. A., Linn, M. C., Mann, L. M., & Clancy, M. J. (1993). Mind your Ps and Qs: Using parentheses and quotes in LISP. In C. R. Cook, J. C. Scholtz, & J. C. Spohrer (Eds.), *Empirical Studies of Programmers: Fifth Workshop*, (pp. 62-85). Norwood, NJ: Ablex.

INVITED SUBMISSIONS

Davis, E. A., McNeill, K., et al. (2019). *Design specifications for educative curriculum materials in OpenSciEd*. (Invited white paper for OpenSciEd.) Abbreviated version of report available at shorturl.at/enBHY

Davis, E. A., & Boerst, T. (2014). Designing elementary teacher education to prepare well-started beginners. *TeachingWorks Working Papers*. TeachingWorks: University of Michigan. Available at <http://www.teachingworks.org/research-data/workingpapers>

Davis, E. A., & Bricker, L. (2013). *Science and Literacy in Teacher Education: What do Preservice Teachers Need to Know and Be Able to Do?* Invited paper presented at the National Academy of Sciences Workshop on Exploring the Overlap between "Literacy for Science" and the Practice of Obtaining, Evaluating, and Communicating Information. Available at http://sites.nationalacademies.org/DBASSE/BOSE/DBASSE_085962

Carlson, J., Davis, E. A., & Buxton, C. (2014). *Supporting the implementation of the Next Generation Science Standards (NGSS) through research: Curriculum materials*. Retrieved from <https://narst.org/ngsspapers/curriculum.cfm>. (Invited NARST position paper.)

Davis, E. A., & Sadler, T. (2010). *Report to the National Research Council: NARST feedback on framework for new science education standards*.

OTHER PAPERS

* indicates co-author was current or former student

** indicates co-author was current or former post-doctoral fellow

Davis, E. A., & Haverly, C. (in progress). *Elementary science teacher education: A review of the literature*.

Davis, E. A., & Palincsar, A. S. (under review). *Engagement in high-leverage science teaching practices among novice elementary teachers.*

Arias, A.*, & Davis, E. A. (under revision). *Using a simulated student interaction to support elementary preservice teacher learning.*

Arias, A. M.*, & Davis, E. A. (in press). Justifying predictions: Supporting students' sensemaking and argumentation. *Science and Children.*

Arias, A. M.*, & Davis, E. A. (2016). Making and recording observations. *Science and Children*, 53(8), 54-60.

Davis, E. A. [quoted]. (2014, 1 de junio de). El líder educacional. *La Tercera*. Santiago, Chile, Grupo Copesa: 29.

Davis, E. A., Smithy, J.*, & Petish, D.* (2004). *Designing an online learning environment for new elementary science teachers: Supports for learning to teach.* Ann Arbor, MI: University of Michigan.

Davis, E. A., & Kirkpatrick, D. (2002). It's All The News: Critiquing evidence and claims. *Science Scope*, 25(5), 32-37.

Davis, E. A. (1998). *Scaffolding students' reflection for science learning.* Unpublished doctoral dissertation, University of California, Berkeley, CA.

Davis, E. A., & Bell, P. (1995, Summer). Using the Net to foster a critical eye in science class. *GSE Term Paper*, 1(2), 1.

Davis, E. A., & Bell, P. (1995). Using the Net to foster a critical eye in science class. *Instructional Technology Program Newsletter*, 8(1), 2.

Available at <http://www.kie.berkeley.edu/KIE/info/publications/article.html>.

INVITED PRESENTATIONS

Davis, E. A., Janssen, F., & Van Driel, J. (August 2017). Teachers and science curriculum materials: Where we are and where we need to go. (Authors are listed alphabetically.) Invited presentation for the European Science Education Research Association (ESERA).

Davis, E. A. (2017, March). *Effectively supporting science teachers' learning: Theoretical and practical underpinnings.* Invited talk for the Board of Science Education's convening for the Science Mission Directorate of NASA, aimed at improving NASA's public education and outreach efforts.

Wilson, S., Schweingruber, H., & Davis, E. A. (2016, June). *Science teachers' learning: Enhancing opportunities, creating supportive contexts.* Invited webinar for STEMx, a multi-state STEM network involving 20 STEM networks nationwide.

Davis, E. A. (2016, February). *Preparing elementary teachers for ambitious science teaching.* Invited talk at Wisconsin Center for Education Research, University of Wisconsin.

Davis, E. A., & Boerst, T. (2015, December). *Reimagining teacher education.* Invited meeting with University of Pennsylvania Graduate School of Education Teacher Education Task Force.

Carlson, J., Davis, E. A., & Buxton, C. (2015, January). *Supporting the implementation of the Next Generation Science Standards (NGSS) through research: Curriculum materials.* Invited webinar for National Science Teachers Association.

Davis, E. A. (2014, November). *Redesigning a teacher education program: A practice-based vision.* Invited talk at ICLON, Leiden University, Leiden, The Netherlands.

Davis, E. A. (2014, October). *Design and benefits of a common lesson planning template.* Invited talk at Facultad de Educación, Pontificia Universidad Católica de Chile, Santiago, Chile.

Davis, E. A. (2014, October). *Determining high-leverage science teaching practices*. Invited talk at Facultad de Educación, Pontificia Universidad Católica de Chile, Santiago, Chile.

Davis, E. A. (2014, October). *The role of reflection in a practice-based teacher education program*. Invited talk at Facultad de Educación, Pontificia Universidad Católica de Chile, Santiago, Chile.

Davis, E. A. (2014, October). *The challenges of preparing teachers to teach science*. Invited talk at the International Seminar "Teacher training: Lessons from international experience, challenges for local training", hosted by Centro de Estudios sobre Políticas y Prácticas en Educación (CEPPE), Pontificia Universidad Católica de Chile, Santiago, Chile.

Davis, E. A. (2014, May). *Reimagining teacher education: Pillars, problems, and promises*. Invited talk at the Childhood and Early Adolescent Education Program Faculty Retreat, Pennsylvania State University.

Davis, E. A., & Bricker, L. (2013, December). *Science and Literacy in Teacher Education: What do Preservice Teachers Need to Know and Be Able to Do?* Invited paper presented at the National Academy of Sciences Workshop on Exploring the Overlap between "Literacy for Science" and the Practice of Obtaining, Evaluating, and Communicating Information. Video of talk available at http://sites.nationalacademies.org/dbasse/bose/currentprojects/dbasse_083999.

Ball, D. L. & Davis, E. A. (2013, October). *Managing to Teach: Developing routines for beginning teaching*. Invited talk in the TeachingWorks Seminar Series "Teaching Teachers Roundtable: Preparing Teachers to use High-Leverage Practices", Ann Arbor, MI. Available at <http://www.teachingworks.org/training/seminar-series/event/detail/2013-14-seminar-implementing-organizational-routines>.

Davis, E. A. (2012, December). *Designing a practice-based elementary teacher education program: Pillars and pedagogies*. Invited talk at University of Maryland.

Davis, E. A. (2012, July). *Reimagining elementary teacher education*. Invited talk at "Connecting Advances in Learning Research and Teacher Practice: A conference about Teacher Education", Teachers College, New York City.

Davis, E. A. & Boerst, T. (2012, May). *Reimagining elementary teacher education*. Invited talk in the TeachingWorks Seminar Series "Learning to Teach: The Practice Curriculum", Ann Arbor, MI. Available at <http://www.teachingworks.org/training/seminar-series/event/detail/university-of-michigan-school-of-education>.

Davis, E. A. (2012, May). *Designing a practice-based elementary teacher education program: Pillars and pedagogies*. Invited talk at Vanderbilt University.

Davis, E. A. (2012, March). *The Next Generation Science Standards: Implications for teacher education and professional development*. Invited talk at the annual meeting of the National Association for Research in Science Teaching, Indianapolis, IN.

Davis, E. A., Sleep, L., & Boerst, T. (2012, February). *Reimagining elementary teacher education*. Invited talk at annual meeting of the American Association of Colleges of Teacher Education, Chicago.

Davis, E. A. (2011, October). *Scientific practices in elementary schools*. Invited talk at REESE Principal Investigator Meeting at the National Science Foundation, Arlington, VA.

Davis, E. A. (2010, April 20). *Beginning elementary teachers, curriculum materials, and inquiry-oriented science teaching*. Invited talk at the Center for Excellence in Science, Mathematics, and Engineering Education at Iowa State University, Ames, Iowa.

Davis, E. A. (2010, February 18). *The journey of a science teacher educator: Approximating practice and practicing approximation*. Pattishall Award lecture, University of Michigan, Ann Arbor, MI.

Davis, E. A. (2008, May). *Characterizing elementary science teachers' knowledge*. Invited talk at the Understanding the Knowledge for Teaching conference, University of Michigan, Ann Arbor, MI.

Davis, E. A. (2008, April). *Science teacher education in the US: Challenges and research*. Invited talks at Beijing Normal University Teacher Education Research Center (Beijing), China Association for Science and Technology (Beijing), Zhejiang Normal University (Jinhua, China), Shanghai Association for Science and Technology (Shanghai).

Davis, E. A. & Beyer, C. (2007, July 23). *Designing and researching educative curriculum materials that promote teacher learning*. Invited plenary address at the Center for Curriculum Materials in Science Knowledge Sharing Institute, Washington, DC.

Davis, E. A. (2006, May 23). *Designing and evaluating educative curriculum materials that promote teacher learning*. Invited address at the Lawrence Hall of Science, University of California at Berkeley, Berkeley, CA.

Davis, E. A. (2005, April 14). *Using technology and curriculum materials to support new elementary school science teachers*. Invited address in honor of receiving the Jan Hawkins Early Career Award for Humanistic Research and Scholarship in Learning Technologies, presented at the annual meeting of the American Educational Research Association, Montreal.

Davis, E. A. (2003, November 5). *Designing supports for new elementary science teachers: Research, challenges, and solutions*. Invited address presented at the Women at the Center Annual Meeting, Ann Arbor.

CONFERENCE PAPERS AND PRESENTATIONS AND OTHER TALKS

Bennion, A., & Davis, E. A. (2020). *Engaging in the science practices: Preservice elementary teachers' experiences and lesson-planning in a physics course*. Paper was to be presented at the annual meeting of the NARST organization, Portland, OR; conference was canceled due to COVID-19.

Bennion, A., Bismack, A., Davis, E. A., & Palincsar, A. S. (2020). *The role of context in the development of elementary science teachers*. Paper was to be presented at the annual meeting of the NARST organization, Portland, OR; conference was canceled due to COVID-19.

Haverly, C., Lyle, A., Peurach, D., Spillane, J., & Davis, E. (2020, April). *Towards a theoretical framework for elementary science education reform*. Paper was to be presented at the Annual Meeting of the American Education Research Association, San Francisco, California; conference was canceled due to COVID-19.

Lyle, A., Haverly, C., Spillane, J., Peurach, D., & Davis, E. (2020, April). *Using standards to drive instructional improvement in elementary science: State policy contexts and the NGSS*. Paper was to be presented at the Annual Meeting of the American Education Research Association, San Francisco, California; conference was canceled due to COVID-19.

Bennion, A., & Davis, E. A. (2019). *Preservice elementary teachers' exposure to the science practices in a physics course*. Poster presented at the annual meeting of the NARST organization, Baltimore, MD.

Palincsar, A. S., & Davis, E. A. (2019). *Sensemaking and teaching in the science education literature: A conceptual review*. Paper presented at the annual meeting of the NARST organization, Baltimore, MD.

Davis, E. A., & Palincsar, A. S. (2019). *The development of high-leverage science teaching practices among novice elementary teachers*. Paper presented at the annual meeting of the NARST organization, Baltimore, MD.

Bismack, A., Davis, E. A., & Palincsar, A. S. (2019). *Novice elementary teachers' development of their content knowledge for teaching science over time*. Paper presented at the annual meeting of the NARST organization, Baltimore, MD.

Bennion, A., Davis, E. A., & Palincsar, A. S. (2019). *Preservice elementary teacher knowledge and use of science practices*. Paper presented at the annual meeting of the NARST organization, Baltimore, MD.

Marino, J.-C., Bennion, A., Davis, E. A., & Palincsar, A. S. (2019). *Novice teachers' use of tools and frameworks from their science methods course*. Paper presented at the annual meeting of the NARST organization, Baltimore, MD.

Bismack, A., Davis, E. A., & Palincsar, A. S. (2019). *Practice-based teacher education and school contexts: Supporting novice elementary teachers' science knowledge for teaching*. Paper presented at the American Educational Research Association, Toronto.

Arias, A., & Davis, E. A. (2019). *Simulated student interactions and elementary preservice teacher learning*. Paper presented at the Simulations in Teacher Education conference (funded by NSF), Louisville, KY.

Arias, A., & Davis, E. A. (2017). *Using a simulated student interaction to support elementary preservice teacher learning*. Paper presented at the annual meeting of the American Educational Research Association, San Antonio, TX.

Davis, E. A., Palincsar, A. S., Bismack, A., & Tupper, B. (2017). *Trajectories of development for ambitious elementary science teaching*. Paper presented at the annual meeting of the American Educational Research Association, San Antonio, TX.

Kuck, R., Davis, E. A., & Palincsar, A. S. (2017). *Teacher educator moves and intern responses in rehearsals of elementary science lessons*. Paper presented at the annual meeting of the American Educational Research Association, San Antonio, TX.

Kademian, S., & Davis, E. A. (2017). *Supporting beginning teacher planning of investigation-based science discussions*. Paper presented at the annual meeting of NARST, San Antonio, TX.

Bismack, A. S., Handley, J., Davis, E. A., & Palincsar, A. S. (2017). *Investigating content knowledge for teaching science*. Paper presented at the annual meeting of the NARST organization, San Antonio, TX.

Davis, E. A. & Palincsar, A. S. (2017). *Investigating high-leverage science teaching practices*. Paper presented at the annual meeting of the NARST organization, San Antonio, TX.

Palincsar, A. S., Davis, E. A., Tupper, B., & Kuck, R. (2017). *Investigating beginning preservice teachers' knowledge and beliefs about teaching*. Paper presented at the annual meeting of the NARST organization, San Antonio, TX.

Tupper, B., Davis, E. A., & Palincsar, A. S. (2017). *Investigating equity-focused leverage points*. Paper presented at the annual meeting of the NARST organization, San Antonio, TX.

Bismack, A., Davis, E. A., & Palincsar, A. S. (2017). *Preservice teachers' use of their content knowledge for teaching science*. Paper presented at the Association for Science Teacher Education, Des Moines, IA.

Davis, E. A., Kloser, M., Wells, A., Windschitl, M., & Carlson, J. (2016). *Teaching the practice of leading sensemaking discussions in science: Using rehearsals*. Paper presented at the annual meeting of the American Educational Research Association, Washington, DC.

Davis, E. A. (2016). *Evolving goals, pedagogies, and identities as a science teacher educator: Prioritizing practice*. Poster presented at the annual meeting of NARST, Baltimore, MD.

Kademian, S. & Davis, E. A. (2016). *Supporting beginning teacher planning of investigation-based science discussions*. Paper presented at the annual meeting of NARST, Baltimore, MD.

- Arias, A., Smith, P. S., Marino, J.-C., Davis, E. A., & Palincsar, A. S. (2015). *Justifying predictions: Connecting use of educative curriculum materials to students' engagement in science practices*. Poster presented at the annual meeting of the NARST organization, Chicago.
- Arias, A., & Davis, E. A. (2015). *Supporting elementary students to construct evidence-based claims: Learning during a practice-based science methods course*. Paper presented at the annual meeting of the NARST organization, Chicago.
- Kademian, S., Arias, A., Davis, E. A., & Palincsar, A. S. (2015). *Analyzing teacher adaptations of two investigation-based science units: Teaching with the goals of the NGSS in mind*. Paper presented at the annual meeting of the NARST organization, Chicago.
- Marino, J.-C., Arias, A., Davis, E. A., & Palincsar, A. S. (2015). *Opportunities for scaffolding elementary students' engagement in scientific practices*. Poster presented at the annual meeting of the American Educational Research Association, Chicago.
- Davis, E. A., Shaughnessy, M., & Boerst, T. (2014). *Designing an elementary teacher education program to foster ethical and skillful beginning teaching practice*. Paper presented at the annual meeting of the American Educational Research Association, Philadelphia.
- Arias, A. M., Marino, J.-C., Davis, E. A., & Palincsar, A. S. (2014). *Teachers' use of curriculum material to engage elementary students in science practices integrated with science content*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Pittsburgh.
- Iwashyna, S., Arias, A. M., Davis, E. A., & Palincsar, A. S. (2014). *'Barely four hours a week': Goals, priorities, and trade-offs in one elementary teacher's investigation-based science instruction*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Pittsburgh.
- Kademian, S. M., Arias, A. M., Davis, E. A., & Palincsar, A. S. (2014). *Supporting use of scientific academic language: Teachers' use of content-focused educative features*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Pittsburgh.
- Boerst, T., Shaughnessy, M., & Davis, E. A. (2014). *Assessing the use of content knowledge in practice in an elementary teacher education program*. Presentation at the American Association of Colleges for Teacher Education, Indianapolis.
- Arias, A., Bismack, A., Davis, E. A., & Palincsar, A. S. (2013). *Finding evidence in the enactment: Elementary science teachers' use of educative curriculum materials*. Paper presented at the NARST international annual meeting, Rio Grande, Puerto Rico.
- Benedict-Chambers, A., Kademian, S., Davis, E. A., & Palincsar, A. S. (2013). *Activity-theoretical research on teachers' use of educative curriculum materials to engage students in using scientific explanations*. Paper presented at the NARST international annual meeting, Rio Grande, Puerto Rico.
- Bismack, A., Arias, A., Davis, E. A., & Palincsar, A. S. (2013). *Student work as evidence of teacher uptake of educative curriculum materials*. Poster presented at the NARST international annual meeting, Rio Grande, Puerto Rico.
- Shaughnessy, M., Boerst, T., & Davis, E. A. (2013). *Developing high-leverage practices in an elementary teacher education program*. Paper presented at the American Association of Colleges for Teacher Education, Orlando, FL.
- Davis, E. A., Palincsar, A. S., Arias, A., Schultz, A., Marulis, L., & Iwashyna, S. (2012). *Designing educative curriculum materials: Characterizing a process building on complementary sources of influence*. Paper presented at the annual meeting of the American Educational Research Association, Vancouver, Canada.

Trygstad, P., Smith, P. S., Davis, E. A., & Palincsar, A. S. (2012). *Assessment tools for studying the effect of educative curriculum materials*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Indianapolis, IN.

Schultz, A., Arias, A., Davis, E. A., & Palincsar, A. S. (2012). *Connecting curriculum materials and teachers: Elementary science teachers' enactment of a reform-based curricular unit*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Indianapolis, IN.

Arias, A., Davis, E. A., & Palincsar, A. S. (2012). *Supporting elementary students in making and recording scientific observations*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Indianapolis, IN.

Bamberger, Y., & Davis, E. A. (2011). *Students' modeling performances across content areas and within a modeling learning progression*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Orlando, FL.

Hagerty, J., & Davis, E. A. (2011). *Mechanistic reasoning in middle school students' consensus models of smell*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Orlando, FL.

Nelson, M., & Davis, E. A. (2011). *Supporting elementary and middle school students in developing, using, and refining scientific models*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Orlando, FL.

Nelson, M., & Davis, E. A. (2011). *Approximations of practice in an elementary science methods course: Preservice teachers learning to teach investigations*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Orlando, FL.

Davis, E. A., & Nelson, M. (2011). *Using approximations of practice in elementary science teacher education*. Paper presented at the annual meeting of the American Educational Research Association, New Orleans.

Davis, E. A., & Nelson, M. (2011). *Elementary teacher candidates' engagement with student thinking when planning science lessons*. Paper presented at the annual meeting of the American Educational Research Association, New Orleans.

Hagerty, J., Davis, E. A., & Clowes, S. (2010). *Revealing the science learner: Examining middle school students' use of evidence and reasoning in revising scientific models*. Poster presented at the annual meeting of the National Association of Research in Science Teaching.

Davis, E. A., Nelson, M., Hug, B., Kenyon, L., Cotterman, M., & Teo, T. W. (2010). *Preservice teachers and scientific modeling: Synthesizing results of a multi-year, multi-site project*. Paper presented at the Association for Science Teacher Education, Sacramento, CA.

Nelson, M., & Davis, E. A. (2010). *Preservice elementary teachers' evaluations of elementary student-generated scientific models: An aspect of pedagogical content knowledge for scientific modeling*. Paper presented at the Association for Science Teacher Education.

Davis, E. A. (2009). *Helping beginning elementary teachers learn high-leverage practices of science teaching when science is invisible in elementary classrooms*. Paper accepted for the annual meeting of Science Education at the Crossroads, Portland, OR. (Withdrawn due to scheduling conflict.)

Schwarz, C., Reiser, B., Fortus, D., Shwartz, Y., Acher, A., Davis, E. A., et al. (2009). *MoDeLS: Defining a learning progression for scientific modeling*. Paper presented at the LeaPS Conference for Learning Progressions.

Beyer, C., & Davis, E. A. (2009, April 17-21). *The role of preservice elementary teachers' pedagogical content knowledge for science teaching in learning to engage in curricular planning*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Garden Grove, CA.

Forbes, C., & Davis, E. A. (2009, April 17-21). *Preservice elementary teachers' curriculum design and development of pedagogical design capacity for inquiry: An activity-theoretical perspective*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Garden Grove, CA.

Nelson, M., & Davis, E. A. (2009, April 17-21). *Preservice elementary teachers' lesson plan modifications: Models, modeling, and metamodeling knowledge*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Garden Grove, CA.

Forbes, C., Madeira, C., Davis, E. A., & Slotta, J. (2009, April 13-17). *Activity-theoretical research on science teachers' learning: Challenges and opportunities*. Paper presented at the annual meeting of the American Educational Research Association, San Diego, CA.

Kenyon, L., Davis, E. A., & Hug, B. (2009, April 13-17). *Design approaches to support teachers in modeling practices*. Paper presented at the annual meeting of the American Educational Research Association, San Diego.

Forbes, C., & Davis, E. A. (2009, January 8-10). *Preservice elementary teachers' use of science curriculum materials: Initial attempts at curriculum design for inquiry-oriented science teaching*. Paper presented at the annual meeting of the Association for Science Teacher Education, Hartford, CT.

Davis, E. A. (2008, July). *Elementary teachers' ideas about effective science teaching: A longitudinal study*. Paper presented at the 2008 International Conference of the Learning Sciences, Utrecht, the Netherlands.

Beyer, C., & Davis, E. A. (2008). *Supporting preservice elementary teachers' critique and adaptation of science curriculum materials using two types of educative supports*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Baltimore.

Beyer, C., & Davis, E. A. (2008). *Using written prompts to support second graders in building scientific explanations*. Poster presented at the annual meeting of the National Association for Research in Science Teaching, Baltimore.

Davis, E. A. (2008). *Beginning elementary teachers*. Invited talk presented at the annual meeting of the National Association for Research in Science Teaching, Baltimore.

Davis, E. A., Nelson, M., & Beyer, C. (2008). *Using educative curriculum materials to support teachers in developing pedagogical content knowledge for scientific modeling*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Baltimore, MD.

Forbes, C., & Davis, E. A. (2008). *Beginning elementary teachers' learning to use questions and questioning in inquiry-oriented science teaching: A longitudinal study*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Baltimore.

Hug, B., Kenyon, L., Teo, T. W., Nelson, M., Cotterman, M., & Davis, E. A. (2008). *Promoting preservice teachers' understanding and use of scientific modeling in teaching and learning*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Baltimore.

Davis, E. A. (2008). *Beginning elementary teachers' ideas about inquiry and effective science teaching: A longitudinal study*. Paper presented at the annual meeting of the American Educational Research Association, New York.

Reiser, B., Schwarz, C., Shwartz, Y., Kenyon, L., Davis, E. A., Fortus, D., et al. (2008). *MoDeLS: Articulating a learning progression for scientific modeling*. Poster presented at the annual meeting of the American Educational Research Association, New York.

Davis, E. A., Kenyon, L., Hug, B., Nelson, M., Beyer, C., Schwarz, C., et al. (2008). *MoDeLS: Designing supports for teachers using scientific modeling*. Paper presented at the annual meeting of Association of Science Teacher Education, St. Louis, MO.

Beyer, C., & Davis, E. A. (2008). *Supporting preservice elementary teachers' critique and adaptation of science curriculum materials using educative curriculum materials*. Paper presented at the annual meeting of the Association for Science Teacher Education, St. Louis, MO.

Forbes, C., & Davis, E. A. (2008). *Preservice elementary teachers' curricular role identity for science teaching: A multi-year study*. Poster presented at the annual meeting of the Association for Science Teacher Education, St. Louis, MO.

Beyer, C., & Davis, E. A. (2007, July 25). *Supporting preservice elementary teachers' critique and adaptation of science curriculum materials using two types of educative supports*. Paper presented at the Center for Curriculum Materials in Science Knowledge Sharing Institute, Washington, DC.

Beyer, C., & Davis, E. A. (2007). *Fostering second-graders' scientific explanations using educative curriculum materials: A beginning elementary teacher's perspective and practice*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, New Orleans.

Beyer, C. J., Delgado, C., Davis, E. A., & Krajcik, J. (2007). *Investigating high school biology texts as educative curriculum materials: Curriculum review process*. Poster presented at the annual meeting of the National Association for Research in Science Teaching, New Orleans.

Davis, E. A., Beyer, C., Forbes, C., & Stevens, S. (2007). *Promoting pedagogical design capacity through teachers' narratives*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, New Orleans.

Forbes, C., & Davis, E. A. (2007). *Beginning elementary teachers' learning through the use of science curriculum materials: A longitudinal study*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, New Orleans, and at the Center for Curriculum Materials in Science Knowledge Sharing Institute, Washington, DC.

Smithey, J., & Davis, E. A. (2007). *The development of preservice elementary teachers' knowledge about learners' science ideas*. Paper presented at the annual meeting of the National Association of Research in Science Teaching, New Orleans.

Stevens, S., & Davis, E. A. (2007). *New elementary teachers' knowledge and beliefs about instructional representations: A longitudinal study*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, New Orleans, and at that Center for Curriculum Materials in Science Knowledge Sharing Institute, Washington, DC.

Forbes, C., & Davis, E. A. (2007, January 3-7). *Exploring preservice elementary teachers' role identity development in respect to the use of curriculum materials for science*. Paper presented at the annual meeting of the Association for Science Teacher Education, Clearwater Beach, FL.

Beyer, C., & Davis, E. A. (2006). Characterizing the quality of second-graders' observations and explanations to inform the design of educative curriculum materials. In S. Barab, K. Hay & D. Hickey (Eds.), *The Proceedings of the 7th International Conference of the Learning Sciences* (pp. 43-49). Mahwah, NJ: Lawrence Erlbaum Associates.

Smithey, J., & Davis, E. A. (2006). *The development of preservice elementary teachers' knowledge about learners' science ideas*. Paper presented at the annual meeting of the American Educational Research Association, San Francisco.

Forbes, C., & Davis, E. A. (2006, January 12-14). *Exploring preservice elementary teachers' critique and adaptation of science curriculum materials in respect to socioscientific issues*. Paper presented at the annual meeting of the Association for Science Teacher Education, Portland, OR.

Davis, E. A., Smithey, J., & Petish, D. (2004). Designing an online learning environment for new elementary science teachers: Supports for learning to teach. In Y. B. Kafai, W. A. Sandoval, N. Enyedy, A. S. Nixon & F. Herrera (Eds.), *Proceedings of the 6th International Conference of the Learning Sciences, ICLS2004*. Mahwah, NJ: Lawrence Erlbaum Assoc. (Expanded version presented at NARST 2004 and available at <http://www.umich.edu/~betsyd/DavisCASESNARST04.pdf>.)

Smithey, J., & Davis, E. A. (2004). Preservice elementary science teachers' identity development: Identifying with particular images of inquiry. In Y. B. Kafai, W. A. Sandoval, N. Enyedy, A. S. Nixon & F. Herrera (Eds.), *Proceedings of the 6th International Conference of the Learning Sciences, ICLS2004*. Mahwah, NJ: Lawrence Erlbaum Assoc.

Davis, E. A., Petish, D., & Smithey, J. (2004). *Challenges new science teachers face: A review of the literature and the standards*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Vancouver, BC.

Davis, E. A., Smithey, J., & Petish, D. (2004). *Designing an online learning environment for new elementary science teachers: Supports for learning to teach*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Vancouver, BC. (An extended version of a paper presented at ICLS 2004.) Available at <http://www.umich.edu/~betsyd/DavisCASESNARST04.pdf>.

Petish, D., & Davis, E. A. (2004). *Using educative curriculum materials to promote learning to teach science inquiry*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Vancouver, BC.

Smithey, J., & Davis, E. A. (2004). *Inquiry and identity: Preservice teachers' online talk during instructor- and peer-initiated threads of discussion*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Vancouver, BC. Available at <http://www.umich.edu/~betsyd/smithey narst04.pdf>.

Heitzman, M., Krajcik, J., & Davis, E. A. (2004). *Urban middle school students' use of various representations of chemical reactions*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Vancouver, BC.

Davis, E. A., & Krajcik, J. (2004). *Supporting inquiry-oriented science teaching: Design heuristics for educative curriculum materials*. Paper presented at the annual meeting of the American Educational Research Association, San Diego. Available at <http://www.umich.edu/~betsyd/Davis&KrajcikAERA04.pdf>.

Davis, E. A. (2003). *Changes in prospective elementary teachers' critique and refinement of instructional materials for science*. Paper presented at the National Association for Research in Science Teaching Annual Meeting, Philadelphia. Available at <http://www.umich.edu/~betsyd/DavisNARST2003.pdf>.

Davis, E. A. (2003). *Characterizing and fostering productive reflection in prospective elementary science teachers*. Paper presented at the American Educational Research Association Annual Meeting, Chicago.

Petish, D., Mercer, M., & Davis, E. A. (2003). *Using elementary teachers' beliefs to inform the design of educative science curricula*. Paper presented at the National Association of Research in Science Teaching Annual Meeting, Philadelphia.

Smithey, J., & Davis, E. A. (2003). *Online communities of practice: How does expertise influence the distribution of cognition?* Paper presented at the National Association for Research in Science Teaching Annual Meeting, Philadelphia. Available at <http://www.umich.edu/~jsmithey>.

Davis, E. A. (2002). Scaffolding prospective elementary teachers in critiquing and refining instructional materials for science. In P. Bell, R. Stevens & T. Satwicz (Eds.), *Proceedings of the Fifth International Conference of the Learning Sciences (ICLS)*. Seattle, WA: Lawrence Erlbaum.

Quintana, C., Reiser, B., Davis, E. A., Krajcik, J., Golan, R., Kyza, E., Edelson, D., & Soloway, E. (2002). Evolving a scaffolding design framework for designing educational software. In P. Bell, R. Stevens & T. Satwicz (Eds.), *Proceedings of the Fifth International Conference of the Learning Sciences (ICLS)*. Seattle, WA: Lawrence Erlbaum.

Smithey, J., & Davis, E. A. (2002). Prospective elementary science teachers' online community: Serving as cognitive apprentices and mentors. In P. Bell, R. Stevens & T. Satwicz (Eds.), *Proceedings of the Fifth International Conference of the Learning Sciences (ICLS)*. Seattle, WA: Lawrence Erlbaum.

Petish, D. A., & Davis, E. A. (2002). *Novice elementary teachers' planning and enactment of educative science curricula*. Paper presented at the National Association of Research on Science Teaching Conference, New Orleans.

Petish, D. A., & Davis, E. A. (2002). *Novice elementary teachers' pedagogical reasoning with educative science curricula*. Talk presented at the American Association of Higher Education Conference, Chicago.

Zhang, B., Wu, H.-K., Fretz, E., Krajcik, J., Marx, R., Davis, E. A., & Soloway, E. (2002). *Comparison of modeling practices between experts and novice learners using a dynamic, learner-centered modeling tool*. Paper presented at the National Association of Research on Science Teaching Conference, New Orleans.

Davis, E. A., & Petish, D. (2001). *Developing expertise in science teaching—and in science teacher education*. Paper presented at the American Educational Research Association conference, Seattle. Available at <http://www.umich.edu/~betsyd/DavisPetishAERA01.pdf>.

Davis, E. A., & Bell, P. (2001). *Design principles for scaffolding students' reflection and argumentation in science*. Paper presented at the American Educational Research Association conference, Seattle. See <http://www.umich.edu/~betsyd/scaffolding.htm>.

Petish, D. A., & Davis, E. A. (2001). *Subject matter knowledge and goal preferences among preservice elementary science teachers*. Paper presented at the National Association of Research on Science Teaching Conference, St. Louis. Available at <http://www.umich.edu/~betsyd/Petish.NARST01.pdf>.

Bell, P., & Davis, E. A. (2000). Designing Mildred: Scaffolding students' reflection and argumentation using a cognitive software guide. In B. Fishman & S. O'Connor-Divelbiss (Eds.), *Proceedings of the International Conference for the Learning Sciences 2000*. Mahwah, NJ: Lawrence Erlbaum Associates.

Davis, E. A., & Petish, D. (2000). *Preservice elementary science teachers' understandings of content and teaching: Exploring lenses for analyses*. Paper presented at the American Educational Research Association and National Association for Research in Science Teaching conferences, New Orleans.

Davis, E. A. (1999). *Students' use of prompts for reflection in science learning: Investigating students' ideas about reflection*. Paper presented at the American Educational Research Association Conference, Montreal.

Davis, E. A. (1998). *Reflection prompts in the Knowledge Integration Environment*. Paper presented at the American Educational Research Association Conference, San Diego.

Davis, E. A. (1998). *Supporting autonomy through prompts for reflection*. Paper presented at the National Association for Research on Science Teaching Conference, San Diego.

Davis, E. A. (1997, April). *Students' beliefs about science and learning*. Paper presented at the American Educational Research Association Conference, Chicago. ERIC Document #ED407257.

Hsi, S., Davis, E. A., & Foley, B. (1996, November). *Using the Internet as a Knowledge Integration Environment in Eighth Grade Science*. Paper presented at the Frontiers in Education Conference, Salt Lake City, UT.

The KIE Research Group. (1996, June). *Using the Knowledge Integration Environment*. Demonstration at the National Science Foundation AAT PI Meeting, Washington, DC.

Linn, M. C. & Davis, E. A. (1996, April). *Integrating Technological Support for Inquiry into Science Classrooms*. Demonstration at the American Educational Research Association Conference, New York.

Davis, E. A. (1996, April). *Metacognitive scaffolding to foster scientific explanations*. Paper presented at the American Educational Research Association Conference, New York. ERIC Document #ED394853.

Bell, P. & Davis, E. A. (1996, April). *Designing an activity in the Knowledge Integration Environment*. Paper presented at the American Educational Research Association Conference, New York. Available at http://www.kie.berkeley.edu/KIE/info/publications/AERA96/KIE_Instruction.html.

The KIE Research Group. (1995, October). *The Knowledge Integration Environment: Engaging Middle School Students in an Exploration of Evidence on the Net*. Demonstration at the Computer Supported Collaborative Learning Conference, Bloomington, IN.

Davis, E. A. (1995, September). *The Knowledge Integration Environment and the Computer as Learning Partner*. Demonstration at the Information Technology, K-12 Education, and the Issue of Sustainability Conference, Chattanooga, TN.

Davis, E. A. (1995, April). *Explanations and prompts*. Paper presented at the National Association for Research on Science Teaching Conference, San Francisco, CA.

Davis, E. A., Linn, M. C., Mann, L. M., & Clancy, M. J. (1993, December). *Mind your Ps and Qs: Using parentheses and quotes in LISP*. Paper presented at Empirical Studies of Programmers: Fifth Workshop, Palo Alto, CA.

RESEARCH EXPERIENCE

2018 TO PRESENT

NGSS & SCHOOL SYSTEM INFRASTRUCTURE

Co-PI for the NGSS and Designing School System Educational Infrastructure to Support Elementary School Science Instruction project, funded by the National Science Foundation, led by PI James Spillane at Northwestern and Don Peurach at the University of Michigan.

FOCUS OF MY PARTICIPATION: Starting mainly in year 3 of the project, I will support the classroom-based studies of teachers' and administrators' engagement with the NGSS, including teachers' science instruction.

2018 TO 2019

OPENSIED

Design team chair for educative curriculum materials for the OpenSciEd project, funded by Carnegie Corporation of New York, led by Danny Edelson at BSCS.

FOCUS OF MY PARTICIPATION: Co-lead (with Kate McNeill) for the design team focused on educative curriculum materials for this open source instructional materials project. Drafted a white paper presenting design specifications for the educative curriculum materials developed for the project.

2016 TO 2018

CENTERS PROJECT

Science expert on project funded by the Bill & Melinda Gates Foundation, in the Teacher Preparation Transformation Center Initiative, led by Deborah Ball, TeachingWorks.

FOCUS OF MY PARTICIPATION: Development of curriculum materials and other resources for science teacher educators. Materials are available at library.teachingworks.org.

2015 TO PRESENT

SPENCER PROJECT: ATTEST

PI, Spencer project, Using Multiple Lenses to Investigate the Development of Content Knowledge and Teaching Practices in Relationship to Learning Opportunities (funded by the Spencer Foundation; co-PI Annemarie Palincsar)

FOCUS: Research and development around practice-based elementary science teacher education. Interns' trajectories of development of high-leverage science teaching practices and content knowledge for teaching science; connections to teacher education experiences; cross-discipline exploration of the development of ambitious teaching practice at the elementary level. Using complementary conceptual lenses in teacher education.

2015 TO 2018

LUCAS PROJECT

Senior consultant on Lucas Project, Using Multiple Literacies in Project Based Learning, led by Joe Krajcik, Michigan State University, Annemarie Palincsar, University of Michigan, and Emily Miller, University of Wisconsin.

FOCUS OF MY PARTICIPATION: Development of educative features for the grades 3, 4, and 5 science curriculum materials the research group is developing, with particular focus on content supports. Curriculum materials review.

2013 TO 2018

CORE PRACTICES CONSORTIUM

Participant in consortium led by Pam Grossman, Stanford University, Morva McDonald, University of Washington, and Megan Franke, UCLA. Leader of science education group.

FOCUS: Research and development around practice-based teacher education.

2010 TO 2015

ELEMENTARY EDUCATIVE CURRICULUM MATERIALS
FOR TEACHERS OF SCIENCE (ELECTS)

PI, ELECTS project (funded by the National Science Foundation; co-PIs Annemarie Palincsar, UM, and Sean Smith, Horizon Research, Inc.).

FOCUS: Research and development around educative curriculum materials for upper elementary science; exploration of teachers' uptake of educative features intended to support the integration of disciplinary core ideas and scientific practices as evidenced in teachers' practice and student work, as well as a quasi-experimental study characterizing student outcomes in classrooms with and without the educative features.

2009 TO 2011

ELEMENTARY TEACHER EDUCATION PROTOTYPE PROJECT (ETEPP)

Member, ETEPP project at the University of Michigan (funded by the Teacher Education Initiative; Pamela Moss, PI).

FOCUS: Research and development around elementary teacher education at the University of Michigan; focus on engaging teacher candidates in learning to do the work of teaching through an emphasis on high-leverage teaching practices and assessing teacher candidates' learning of these practices; specific focus on high-leverage teaching practices involved in anticipating, eliciting, interpreting, and facilitating student thinking.

2006 TO 2010

CURRICULUM GROUP, TEACHER EDUCATION INITIATIVE

Member of the curriculum group associated with the Teacher Education Initiative at the University of Michigan. Co-chair of science teaching and learning team.

FOCUS: Research and development around teacher education at the University of Michigan; focus on engaging teacher candidates in learning to do the work of teaching through an emphasis on high-leverage teaching practices.

2006 TO 2010

NORTHWESTERN, UNIVERSITY OF MICHIGAN, AND OTHER INSTITUTIONS

Co-PI, Modeling Designs for Learning Science (MoDeLS) project.

FOCUS: The development and design of curriculum materials to promote elementary and middle school students' and teachers' understanding and use of modeling practices, metamodeling knowledge and, for teachers, PCK for scientific modeling; research on preservice and practicing classroom teachers' development with regard to scientific modeling.

2006 TO 2008

CCMS & TELS

Member, DECIDE collaboration

FOCUS: DECIDE is a collaboration involving members of the Center for Curriculum Materials in Science (CCMS) and another NSF-funded Center for Learning and Teaching, called Technology-Enhanced Learning in Science (TELS). DECIDE's mission is to write an edited monograph synthesizing the work of the two centers and to identify policy issues related to improving science instruction nation-wide.

2003 TO 2008

AAAS, UNIVERSITY OF MICHIGAN, MSU, NORTHWESTERN

Leadership team, Center for Curriculum Materials in Science (CCMS).

FOCUS: The development and design of curriculum materials, the relationships among curriculum materials and student and teacher learning, educative curriculum materials, inquiry-oriented curriculum materials, goal-directed curriculum materials.

1998 TO 2009

UNIVERSITY OF MICHIGAN

Principal Investigator, CASES project.

FOCUS: Elementary science teaching, new elementary science teachers, teacher learning, educative elementary science curricula, prompting for reflection, scaffolding, technology, knowledge integration, cognition, teacher tools, teacher identity.

1993 TO 1998

UC-BERKELEY

Research assistant with Professor Marcia Linn on the Knowledge Integration Environment and Computer as Learning Partner projects.

FOCUS: Prompting for reflection, scaffolding, knowledge integration, beliefs about science and learning, technologies for science education, teacher tools, student explanations.

1992 TO 1993

UC-BERKELEY

Research assistant with Professors Marcia Linn and Michael Clancy on the Hypermedia Case Studies in Computer Science project.

FOCUS: Sense-making, rule use, parentheses and quotes in LISP, instructional intervention, on-line and off-line experiences.

1988 TO 1989

PRINCETON UNIVERSITY

Undergraduate researcher with Professor Alain Kornhauser.

TEACHING EXPERIENCE

1998 TO PRESENT

SCHOOL OF EDUCATION—UNIVERSITY OF MICHIGAN

Assistant, Associate, Full professor of science education.

COURSES: Elementary science methods for undergraduates and masters/certificate students.

Theory and research on the development of expertise in science teaching. Theory, research, and use of technological tools in science education and the development of science learning environments.

Professional development seminar for science education and learning technologies doctoral students. Professional development seminar for educational studies doctoral students. Managing to teach, a classroom management class for undergraduate teacher education students. I also serve as lead faculty for science in the elementary teacher education program.

1993 TO 1998

WALNUT CREEK, CA—FOOTHILL MIDDLE SCHOOL

Curriculum and software designer and teaching assistant for 8th grade physical science class.

ACTIVITIES: Designed and developed curriculum and software for KIE, including projects focused on critique. Designed and developed curriculum for CLP, including test questions, surveys, and activities. Served as classroom teacher for KIE projects and CLP labs. Helped students do labs, work on complex projects, and develop improved inquiry skills.

1996 TO 1997

KIE SUMMER TEACHER WORKSHOPS

Curriculum developer and session leader for workshop for new KIE project developers.

ACTIVITIES: Developed materials for and co-taught sessions at workshops for approximately 30 science teachers and educators. Contributed to materials for and teaching of other sessions.

ELIZABETH A. DAVIS

1997 TO 1998 SAN FRANCISCO, CA
Tutor in all subjects and time management for junior high school student.

1997 UC-BERKELEY
KIE liaison for preservice teachers and doctoral students in a course called "Cognitive Consequences of Computers in Education." Provided pedagogical and technical guidance for students developing KIE projects.

1993 TO 1995 BERKELEY, CA—KING JUNIOR HIGH SCHOOL
Tutor in math, English, and history for junior high school students.

1990 COLORADO SPRINGS, CO—HEWLETT-PACKARD CO.
Trainer for business software.

1989 TO 1990 COLORADO SPRINGS, CO—RIGHT TO READ PROGRAM
Tutor for adult literacy.

PROFESSIONAL ACTIVITIES AND SERVICE

PROFESSIONAL SERVICE TO THE FIELD AND CONSULTING

2020 TO PRESENT THE NATIONAL ACADEMIES, NATIONAL RESEARCH COUNCIL
Chair of the National Academies of Science, Engineering, and Medicine committee on Enhancing Science in Prekindergarten through Fifth Grade.

2018 TO PRESENT CAREER PROJECT ADVISORY BOARD
Member of advisory board for NSF-funded CAREER project, PI Eve Manz, Boston University.

2017 TO PRESENT PROJECT ADVISORY BOARD
Member of advisory board for NSF-funded project "SOLID Start", PIs Tanya Wright and Amelia Gotwals, Michigan State University.

2017 TO PRESENT REVIEWER FOR CARNEGIE CORP. OF NEW YORK
Reviewer for proposals to the Carnegie Corporation of New York.

2017 TO PRESENT REVIEWER AND CONSULTANT FOR EDREPORTS.ORG
Reviewer and occasional unpaid consultant for EdReports.org in their development of a review tool for science curriculum materials and their alignment with the Next Generation Science Standards. (Middle school tool consultation during 2017-18. Elementary tool consultation in 2019.)

2017 TO PRESENT NARST EARLY CAREER RESEARCH AWARD COMMITTEE
Member of the committee determining the NARST Early Career Research Award.

2017 TO 2018 NRC COMMITTEE MEMBER, WORKSHOP ON INSTRUCTIONAL MATERIALS
Member of the committee designing a workshop focused on the design, selection, and implementation of instructional materials for the Next Generation Science Standards, sponsored by the National Academies for Sciences, Engineering, and Medicine's Board on Science Education.

2017 REVIEWER FOR AMNH MAT PROGRAM
Consultant to review the Masters of Arts in Teaching earth science teacher certification program at the American Museum of Natural History.

2016 TO PRESENT NSSME+ ADVISORY BOARD
Member of advisory board for the National Survey for Science and Mathematics Education Project, PI Eric Banilower, Horizon Research, Inc.

2016 TO PRESENT CAREER PROJECT ADVISORY BOARD
Member of advisory board for the project "CAREER: Investigating 5th Grade Teachers' Knowledge of Noticing Appalachian Students' Thinking in Science", PI Melissa Luna, West Virginia University.

2008 TO 2011 NATIONAL ASSOCIATION FOR RESEARCH IN SCIENCE TEACHING BOARD
Member of the Board of Directors of the National Association for Research in Science Teaching (NARST) and chair/co-chair of the External Policy and Relations Committee. Co-chair of ad hoc committee to review framework for new national science education standards.

2006 TO 2008 MSP-KMD PROJECT EXPERT ADVISORY COMMITTEE
Member of ad hoc expert advisory committee for the Math Science Partnership—Knowledge Management and Dissemination project, a partnership of Horizon Research, Inc., and the Education Development Center.

2005 TO 2013 JAN HAWKINS AWARD COMMITTEE
Member of the AERA Jan Hawkins Early Career Award Committee.

2005 TO 2009 SIG-LS/ATL STUDENT PAPER AWARD COMMITTEE
Founding member of the AERA SIG-LS/ATL Best Student Paper Award Committee.

2004 TO 2007 NARST DISTINGUISHED CONTRIBUTIONS AWARD COMMITTEE
Member of the NARST Distinguished Contributions Award Committee.

2003 TO 2004 PROGRAM COMMITTEE, ICLS 2004
Member of Program Committee for International Conference for the Learning Sciences, 2004. See <http://www.gseis.ucla.edu/~icls/>.

2003 Advisory Committee, Project Kaleidoscope
Member of Advisory Committee for the regional conference of Project Kaleidoscope, promoting reform in science, technology, engineering, and mathematics teaching at the undergraduate level.

2002 PROGRAM COMMITTEE, ICLS 2002
Member of Program Committee for International Conference for the Learning Sciences, 2002. See <http://depts.washington.edu/cogstudy/ICLS>.

2000 TO PRESENT NATIONAL SCIENCE FOUNDATION
Served on various proposal review panels for the National Science Foundation.

1999 TO 2003 MICHIGAN ASSESSMENT TEAM
Member of the Michigan Assessment Team for the state of Michigan, charged with developing an articulation plan for the state benchmarks.

1998 TO 2001 JRST AWARD COMMITTEE
Member of the *Journal of Research in Science Teaching* Award Committee. Reviewed approximately 20 papers annually for JRST Best Paper Award.

2000 DOCTORAL CONSORTIUM, ICLS 2000
Faculty member of Doctoral Consortium for International Conference for the Learning Sciences, June 13-14, 2000. See <http://www.umich.edu/~icls/>.

1999 TO 2000 EXECUTIVE COMMITTEE, ICLS 2000
Member of Executive Committee and Chair of Cognition Strand for International Conference for the Learning Sciences, 2000. See <http://www.umich.edu/~icls/>.

1999 MILKEN FOUNDATION
Academic participant in Milken Foundation's Teacher-Researcher Conversation for Science Education and Technology. Profiled papers for practitioner use and participated in synchronous and asynchronous on-line discussions.

SERVICE TO THE UNIVERSITY

2017 TO PRESENT ENGINEERING EDUCATION RESEARCH AFFILIATE FACULTY MEMBER
Affiliate faculty member for the new Engineering Education Research unit within the College of Engineering.

2017 TO PRESENT ENGINEERING EDUCATION RESEARCH GRADUATE ADVISORY COMMITTEE
Member of the Engineering Education Research unit's Graduate Advisory Committee.

2017 TO PRESENT ENGINEERING EDUCATION RESEARCH GRADUATE AFFAIRS COMMITTEE
Member of the Engineering Education Research unit's Graduate Affairs Committee.

2015 TO 2016 DEAN SEARCH ADVISORY COMMITTEE
Member of the university committee responsible for making a recommendation to the University of Michigan provost regarding the search for a dean of the School of Education.

2010 COMMITTEE FOR THE INTERNAL REVIEW OF MBGNA
Member of the committee responsible for conducting the internal University review of the Matthaei Botanical Gardens and Nichols Arboretum.

2008 UNIVERSITY OF MICHIGAN CENTER FOR THE EDUCATION OF WOMEN
Member of the 2008 CEW Scholarship Committee.

2005 TO PRESENT MATTHAEI BOTANICAL GARDENS ACADEMIC ADVISORY COMMITTEE
Member of the University of Michigan Matthaei Botanical Gardens and Nichols Arboretum Academic Advisory Committee.

1999 TO 2006 JUNIOR WOMEN FACULTY NETWORK
Member of the advisory board for the Junior Women Faculty Network at University of Michigan, to support the scholarly and personal growth of junior women faculty. Occasional speaker for sessions for junior women faculty members. See <http://www.umich.edu/~cew/faculty-staff/jwfn.htm>.

SERVICE TO THE SCHOOL OF EDUCATION

2018 PANEL PARTICIPANT, TEACHINGWORKS AND U-M TEACHER EDUCATION PANEL
Participated in a panel discussion for a three-day workshop organized by TeachingWorks and the University of Michigan Teacher Education program. Panel focused on use of practice-based teacher education in my elementary science methods course and the elementary teacher education program.

2016 TO 2018 SCIENCE EDUCATION TARGETED SEARCH CHAIR
De facto chair of a targeted search in science education.

2016 TO PRESENT EDUCATION IN MATHEMATICS, SCIENCE, AND TECHNOLOGY UNIT COORDINATOR
Unit coordinator (faculty leader) for the Education in Mathematics, Science, and Technology (EMST) unit of the Educational Studies department in the University of Michigan's School of Education.

2016 TO 2017 CHAIR, JONES-PAYNE-COXFORD AWARD COMMITTEE
Chair of the committee to decide the recipient(s) of the Jones-Payne-Coxford Award at the University of Michigan's School of Education, given to one or more fourth-year doctoral students in mathematics education in recognition of excellent scholarly achievement.

2016 TO 2017 SCHOOL OF EDUCATION PROMOTION AND TENURE COMMITTEE
Elected member of the University of Michigan's School of Education Promotion and Tenure Committee. (Elected to begin 2015, but due to other service obligations, term began 2016.)

2015 TO PRESENT LEAD FACULTY, SCIENCE, FOR ELEMENTARY TEACHER EDUCATION PROGRAM
Lead faculty in charge of instructional design, programmatic design, staffing, apprenticeships, and course substitutions for science-related issues in the elementary teacher education program (undergraduate and masters).

2015 TO PRESENT SOE CONTACT FOR OCCUPATIONAL SAFETY AND ENVIRONMENTAL HEALTH
Coordinator for the School of Education's science laboratory and contact for the Occupational Safety and Environmental Health (OSEH) office on campus, to ensure laboratory safety and maintenance of inventory protocols.

2011 TO 2014, 2018 TO PRESENT SCHOOL OF EDUCATION EXECUTIVE COMMITTEE
Ex officio member of the University of Michigan's School of Education Executive Committee, the School's faculty governance committee, as Chair of Teacher Education Cabinet.

2010 TO 2013 SCHOOL OF EDUCATION ELEMENTARY CURRICULUM DESIGN GROUP
As Chair of Elementary Teacher Education, serve as the chair of the Elementary Curriculum Design Group, constituted of faculty and staff to work on program design, instruction, and assessment.

2010 TO 2014 SCHOOL OF EDUCATION TEACHER EDUCATION CABINET
As Chair of Elementary Teacher Education, serve as member (and rotating Chair) of the University of Michigan's Teacher Education Cabinet, the faculty leadership committee for the teacher education programs in the School of Education.

2008 TO 2011 SCHOOL OF EDUCATION EXECUTIVE COMMITTEE
Voting member of the University of Michigan's School of Education Executive Committee, the School's faculty governance committee.

2008, FALL EDUCATION IN MATHEMATICS, SCIENCE, AND TECHNOLOGY UNIT COORDINATOR
Interim unit coordinator (faculty leader) for the Education in Mathematics, Science, and Technology (EMST) unit of the Educational Studies department in the University of Michigan's School of Education.

2007 TO 2009 SCHOOL OF EDUCATION GRADUATE AFFAIRS COMMITTEE
Member of the University of Michigan's School of Education Graduate Affairs Committee.

2006 TO 2010 KAPPA DELTA PI FACULTY COUNSELOR
Faculty counselor for Kappa Delta Pi, an international honor society in education involving preservice teachers in education-focused service and professional development activities.

2003 TO 2006, 2007 TO 2008 EDUCATIONAL STUDIES EXECUTIVE COMMITTEE
Member of the University of Michigan's School of Education Educational Studies Executive Committee.

2001 TO 2004 CPEP EXECUTIVE COMMITTEE
Served on the University of Michigan's Combined Program in Education and Psychology Executive Committee.

2000 TO PRESENT (INTERMITTENT) SCHOOL OF EDUCATION SEARCH COMMITTEES
Served on, co-chaired, and chaired various search committees for the School of Education.

EDITORIAL BOARDS, REVIEW BOARDS, AND REVIEWING

American Educational Research Journal (Editorial Board, 2016 to 2020; selected as an Outstanding Reviewer for 2016)

Cognition and Instruction

Convergence

Educational Psychologist

Instructional Science

International Journal of Science Education

Journal of Educational Psychology

Journal of Research in Science Teaching (Editorial Board 2006-2010)

Journal of Science Teacher Education

Journal of Teacher Education

Journal of Technology and Teacher Education (previously member of Editorial Board)

Science

Science Education

Teaching and Teacher Education

The Journal of the Learning Sciences (Review Board 2001-2009, 2015 to present; selected as Reviewer of the Year in 2017)

American Education Research Association conference proposals (various divisions and SIGs)

International Conference for the Learning Sciences papers and doctoral consortia

National Association for Research on Science Teaching conference proposals (various strands)

National Science Foundation grant proposals (various programs)

American Association for the Advancement of Science conference proposals

MEMBERSHIPS

American Education Research Association

AERA Division C, Section 3: Science Learning & Instruction

AERA Division C, Section 4: Learning Environments

AERA Division K: Teaching and Teacher Education.

AERA Special Interest Group—Learning Sciences (SIG-LS)

(formerly SIG-Education in Science and Technology, or SIG-EST)

AERA Special Interest Group—Advanced Technologies in Learning (SIG-ATL)

AERA Special Interest Group—Science Teaching and Learning (SIG-STL)

(formerly SIG-Subject Matter Knowledge and Conceptual Change, or SIG-SMKCC)

International Society of the Learning Sciences (founding member)

National Association for Research on Science Teaching

National Science Teachers Association

Association for Science Teacher Education

American Association of University Women

Sigma Xi (scientific honor society)

Kappa Delta Pi (international honor society in education)

Phi Kappa Phi (collegiate honor society for all academic disciplines)

OTHER PROFESSIONAL EXPERIENCE

1991 TO 1992

COLORADO SPRINGS, CO—HEWLETT-PACKARD CO.

Colorado Springs Division

Process engineer in Support Engineering group in manufacturing plant.

1989 TO 1991

COLORADO SPRINGS, CO—HEWLETT-PACKARD CO.

Logic Systems Division

Process analyst in Manufacturing Systems Analysis group in manufacturing plant.

ADVISEES AND STUDENTS' COMMITTEES

MASTERS ADVISEES

1. Aimee Giles (2001)
2. Jue Shi (2004)
3. Christine Yee (2004)
4. Christine Dietz (2006)
5. Nicole Sielken (2006)
6. Elisa Collins (2007)
7. Sarah Clowes (left 2009)
8. Wan-Tzu (Claire) Lo (2009)
9. Bob Barretto (2010)
10. Laura Gibbons (2011)
11. Amber Schultz (now Bismack; 2011)
12. Jinghao (Andy) Shi (2012)
13. Lisa Sramkoski (2013)
14. Billy Clifford-Nunn (2013; official advisor Addison Stone)
15. Kristin Giorgio (2019)
16. Peter Siciliano

CURRENT DOCTORAL ADVISEES

1. Adam Bennion
2. Benjamin Tupper (on leave)

ACTIVE DISSERTATION COMMITTEES

1. Adam Bennion
2. Benjamin Tupper (co-chair)

COMPLETED DISSERTATION COMMITTEES: CHAIR OR CO-CHAIR

1. Debra Petish (2004)
Using educative curriculum materials to support new elementary teachers' practice and learning
2. Denise Conanan Nacu (co-chair, 2004)
Fostering reflection and social support in design critiques
3. Julie Smithy (2008)
The development of preservice elementary teachers' knowledge about learners' science ideas
4. Carrie Beyer (2009)
Using reform-based criteria to support the development of preservice elementary teachers' pedagogical design capacity for analyzing science curriculum materials
5. Cory Forbes (2009) – Recipient of the NARST Early Career Research Award in 2014
Preservice elementary teachers' development of pedagogical design capacity for inquiry – an Activity-Theoretical perspective
6. Michele Nelson (2011)
Approximations of practice in the preparation of prospective elementary science teachers
7. Mary Heitzman Van de Kerkhof (2012)
Sixth graders' engagement with prose and graphics as they read and make meaning of science texts
8. Anna Maria Arias (2015) – Recipient of the UM-SOE Dimond Dissertation Award in 2016
Learning to teach elementary students to construct evidence-based claims of natural phenomena
9. Sylvie Kademian (2017)
Supporting beginning teacher planning and enactment of investigation-based science discussions: The design and use of tools within practice-based teacher education
10. Amber Bismack (2019)
Content knowledge for teaching science: A longitudinal study of novice elementary teachers' knowledge development in a practice-based teacher education program and school contexts
11. John-Carlos Marino (2019)
Elementary students' coordination of claims and evidence in science and history

COMPLETED DISSERTATION COMMITTEES: MEMBER (NON-CHAIR)

1. Soo-Young Lee (2001)
2. Hsin-Kai Wu (2002)
3. Kristin Bass (2003)
4. Hee-Sun Lee (2003)
5. BaoHui Zhang (2003)
6. Jacob Foster (2004)
7. Monica Hartman (2004)
8. Silvia Wen-Yu Lee (2004)
9. Valerie Talsma (2004)
10. Amelia Gotwals (2006)
11. Christopher Harris (2006)
12. Kate McNeill (2006)
13. Hsin-Yi Chang (2007)
14. Charles Dershimer (2007)
15. Jeff Nordine (2007)
16. Leema Kuhn Berland (Northwestern University, 2008)
17. Debi Khasnabis (2008)
18. Cesar Delgado (2009)
19. Laurie Sleep (2009)
20. Jenny Sealy Badee (2010)
21. Eric Fretz (2010)

22. Joi Merritt (2010)
23. Molly Yunker (2010)
24. Chia-Ling Chen (2011)
25. Nirit Glazer (2011)
26. Ashima Mathur Shah (2011)
27. Monica Ko (Northwestern University, 2013)
28. Amanda Benedict-Chambers (2014)
29. Andy Kwok (2015)
30. Diana Sherman (2016)
31. Jared Aumen (2017)
32. Shannan Hibbard (2017; School of Theatre, Music, and Dance; cognate member)
33. Susanna Farmer (2019)

POSTDOCTORAL FELLOWS

1. Shawn Stevens (CCMS 2005-2008)
2. Barbara Ladewski (MoDeLS 2007-2008)
3. Yael Bamberger (MoDeLS 2009-2010)
4. Carrie Beyer (TEI 2010-2011)
5. Sylvie Kademian (Centers 2017-2018)

VISITING STUDENTS

1. Kim Lange (science education student from University of Münster; at UM Fall 2009)
2. Seshini Pillay (Moody Exchange Scholar; physics education student at University of Cape Town; at UM 2009)