DEBORAH LOEWENBERG BALL

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EDUCATION

1988	Ph.D.	Michigan State University Major: Curriculum, Teaching, and Educational Policy; Teacher Preparation and Staff Development. Minor: Mathematics Education. Dissertation: *Knowledge and reasoning in mathematical pedagogy: Examining what prospective teachers bring to teacher education*.
1981 – 1983		Michigan State University Undergraduate mathematics courses: algebra; calculus and analytic geometry, I, II, III; number theory.
1982	M.A.	Michigan State University Major: Teacher Education. Minors: Reading, mathematics education.
1976	B.A.	Michigan State University Majors: French and Elementary Education. Minor: Language Arts. Graduated with highest honor.

PROFESSIONAL EXPERIENCE

2011 –	Research professor, Institute for Social Research, University of Michigan
2011 –	Director, TeachingWorks, University of Michigan
2005 –	Dean, School of Education, University of Michigan
2005 –	William H. Payne Collegiate Professor in Education, University of Michigan
2004 – 2005	Director of Teacher Education, School of Education, University of Michigan
2000 –	Arthur F. Thurnau Professor, University of Michigan
1996 –	Professor, Educational Studies, University of Michigan
1991 – 1996	Associate professor, Department of Teacher Education, Michigan State University
1988 – 1991	Assistant professor, Department of Teacher Education, Michigan State University
1988 – 1992	Third and fourth grade mathematics teacher, Spartan Village School, East Lansing, MI
1975 – 1988	Elementary classroom teacher (grades 1-5), East Lansing Public Schools, East Lansing, MI

PROFESSIONAL WRITING

Selected Journal Articles

Ball, D. L., Ben-Peretz, M. & Cohen, R. (2014). Records of practice and the development of collective professional knowledge. *British Journal of Educational Studies*, *62*, 317–336.

Phelps, G., Corey, D., DeMonte, J., Harrison, D., & Ball, D.L. (2012). How much English language arts and mathematics instruction do students receive? Investigating variation in instructional time. *Educational Policy*, *26*(5), 631–662.

Corey, D., Phelps, G., Ball, D.L., DeMonte, J., & Harrison, D. (2012). Explaining variation in instructional time: An application of quantile regression. *Educational Evaluation and Policy Analysis*, *34*(2), 146–163.

Charalambos, C. Y., Hill, H. C., & Ball, D. L. (2011). Prospective teachers' learning to provide instructional explanations: What does it look like and what might it take? *Journal of Mathematics Teacher Education*, *14*(6), 441–463.

Ball, D. L., & Forzani, F. M. (2011, Summer). Building a common core for learning to teach, and connecting professional learning to practice. *American Educator*, *35*(2), 17–21, 38–39.

Ball, D.L., & Forzani, F.M. (2010). Teaching skillful teaching. *Educational Leadership*, *68*(4), 40–45.

Ball, D.L., & Forzani, F.M. (2010). What does it take to make a teacher? *Phi Delta Kappan*, *92*(2), 8–12.

Thames, M. H. & Ball, D. L. (2010). What mathematical knowledge does teaching require? Knowing mathematics in and for teaching. *Teaching Children Mathematics, 17*(4), 220–225.

Learning Mathematics for Teaching Project. (2010). Measuring the mathematical quality of instruction. *Journal of Mathematics Teacher Education*. Advance online publication. doi:10.1007/s10857-010-9140-1.

Ball, D. L., & Forzani, F. (2009). The work of teaching and the challenge for teacher education. *Journal of Teacher Education*, *60*, 497–511.

Hill, H., & Ball, D. L. (2009). The curious—and crucial—case of mathematical knowledge for teaching. *Phi Delta Kappan*, 68-71.

Ball, D. L. , Sleep, L., Boerst, T., & Bass, H. (2009). Combining the development of practice and the practice of development in teacher education. *Elementary School Journal*, *109,* 458–476.

Ball, D.L., Thames, M.H., & Phelps, G. (2008). Content knowledge for teaching: What makes it special? *Journal of Teacher Education, 59* (5), 389–407.

Hill, H., Blunk, M., Charalambous, C., Lewis, J., Phelps, G., Sleep, L., Ball, D. L. (2008). Mathematical knowledge for teaching and the mathematical quality of instruction: An exploratory study. *Cognition and Instruction, 26* (4), 430–511.

Stylianides, A. J., & Ball, D. L. (2008). Understanding and describing mathematical knowledge for teaching: Knowledge about proof for engaging students in the activity of proving. *Journal of Mathematics Teacher Education, 11*, 307–332.

Hill, H., Ball, D. L., & Schilling, S. (2008). Unpacking "pedagogical content knowledge": Conceptualizing and measuring teachers' topic-specific knowledge of students. *Journal for Research in Mathematics Education, 39* (4), 372–400.

Ball, D. L., Lewis, J., & Thames, M. (2008). Making mathematics work in school. *Journal for Research in Mathematics Education Monograph, 14, A Study of Teaching: Multiple Lenses, Multiple Views.*

Delaney, S., Ball, D.L, Hill, H.C., Schilling, S.G., & Zopf, D. (2008). "Mathematical knowledge for teaching": Adapting U.S. measures for use in Ireland. *Journal of Mathematics Teacher Education, 11*(3), 171–197.

Ball, D.L., & Forzani, F.M. (2007). What makes education research "educational"? *Educational Researcher, 36* (9).

Hill, H.C., Ball, D.L., Blunk, M., Goffney, I.M., & Rowan, B. (2007). Validating the ecological assumption: The relationship of measure scores to classroom teaching and student learning. *Measurement: Interdisciplinary Research & Perspective, 5* (2), 107–118.

Ball, D.L., Goffney, I.M., & Bass, H. (2005). The role of mathematics instruction in building a socially just and diverse democracy. *The Mathematics Educator, 15* (1), 2–6.

Ball, D. L., Ferrini-Mundy, J., Kilpatrick, R. J., Milgram, J., Schmid, W., & Schaar, R. (2005). Reaching for common ground in K-12 mathematics education. *Notices of the American Mathematical Society*, *52* (9), 1055–58.

Ball, D. L., Hill, H.C, & Bass, H. (2005). Who knows mathematics well enough to teach third grade, and how can we decide? *American Educator, 30*(3), 14-17, 20-22, 43–46.

Thames, M. H., & Ball, D. L. (2004). Review of "Learning Discourse: Discursive Approaches to Research in Mathematics Education." *Mathematical Thinking and Learning, 6(4)*, 421–433.

Hill, H., Rowan, B., & Ball, D. L. (2005). Effects of teachers' mathematical knowledge for teaching on student achievement. *American Educational Research Journal*, *42*(2), 371–406.

Ball, D. L., & Rowan, B. (2004). Introduction: Measuring instruction. *Elementary School Journal*, *105*(1), 3–10.

Hill, H. C, Schilling, S., & Ball, D. (2004). Developing measures of teachers' mathematical knowledge for teaching. *Elementary School Journal*, *105*, (1), 11–30.

Hill, H., & Ball, D. L. (2004). Learning mathematics for teaching: Results from California's mathematics professional development institutes. *Journal for Research in Mathematics Education*, *35* (5). 330–351.

Cohen, D., Raudenbush, S., & Ball, D. (2003). Resources, instruction, and research. *Educational Evaluation and Policy Analysis*, *25* (2), 1–24.

Cohen, D. K., & Ball, D. L. (2001). Making change: Instruction and its improvement. *Kappan*, *83* (1), 73–77.

Ball, D. L. (2000). Bridging practices: Intertwining content and pedagogy in teaching and learning to teach. *Journal of Teacher Education*, *51*, 241–247.

Ball, D. L., & Bass, H. (2000). Review of *The Number Devil* by Hans Magnum Enzensberger. *Notices of the American Mathematical Society*, *47* (1), 51–56.

Chazan, D. & Ball, D. L. (1999). Beyond being told not to tell. *For the Learning of Mathematics*, *9*, 2–10.

Price, J., & Ball, D. L. (1998) Crafting a liberatory pedagogy in learning to teach mathematics: Challenges of teaching and teacher education. *Theory Into Practice*, *37*, 256–264.

Ball, D. L. (1997). From the general to the particular: Knowing our students as learners of mathematics. *Mathematics Teacher*, 732–737.

Price, J., & Ball, D. L. (1997) "There's always another agenda": Marshalling resources for mathematics reform. *Journal of Curriculum Studies*, *29*, 637–666.

Ball, D. L. & Wilson, S. W. (1996). Integrity in teaching: Recognizing the fusion of the moral and the intellectual. *American Educational Research Journal*, *33*, 155–192.

Ball, D. L. (1996). Teacher learning and the mathematics reforms: What do we think we know and what do we need to learn? *Phi Delta Kappan*, *77*(7), 500–508.

Ball, D. L., & Cohen, D. K. (1996). Reform by the book: What is—or might be—the role of curriculum materials in teacher learning and instructional reform? *Educational Researcher*, *25,* 6–8, 14.

Wilson, S. W., & Ball, D. L. (1996). Helping teachers meet the standards: New challenges for teacher educators. *Elementary School Journal*, *97*, 121–138.

Wilson, S. M., Peterson, P. L., Ball, D. L., & Cohen, D. K. (1996). Learning by all. *Phi Delta Kappan*, *77* (7), 468–476.

Ball, D. L. (1995). Blurring the boundaries of research and practice. *Remedial and Special Education, 16*, 354–363.

Ball, D. L. (1995). Transforming pedagogy: Classrooms as mathematical communities. A response to Timothy Lensmire and John Pryor. *Harvard Educational Review*, *65*, 670–677.

Ball, D. L. (1993). With an eye on the mathematical horizon: Dilemmas of teaching elementary school mathematics. *Elementary School Journal*, *93*(4), 373–397.

Ball, D. L. (1992). Magical hopes: Manipulatives and the reform of mathematics education. *American Educator, 16*(2), 14–18, 46–47.

Mosenthal, J., & Ball, D. L. (1992). Constructing new forms of subject matter instruction: Subject matter knowledge in inservice teacher education. *Journal of Teacher Education*, *43*, 361–371.

Ball, D. L. (1991) Implementing the *Professional Standards for Teaching Mathematics*: Improving, not standardizing, teaching. *Arithmetic Teacher*, *39* (1), 18–22.

Ball, D. L. (1991). What's all this talk about "discourse"? *Arithmetic Teacher*, *39* (3), 44–48.

Ball, D. L. (1990). Breaking with experience in learning to teach mathematics: The role of a preservice methods course. *For the Learning of Mathematics*, *10* (2), 10–16.

Ball, D. L. (1990). Reflections and deflections of the Framework: The case of Carol Turner. *Educational Evaluation and Policy Analysis*, *12* (3), 263–275.

Ball, D. L. (1990). Prospective elementary and secondary teachers' understandings of division. *Journal for Research in Mathematics Education*, *21*, 132–144.

Ball, D. L. (1990). The mathematical understandings that prospective teachers bring to teacher education. *Elementary School Journal*, *90*, 449–466.

Cohen, D. K., & Ball, D. L. (1990). Policy and practice: An overview. *Educational Evaluation and Policy Analysis*, *12* (3), 347–353.

Cohen, D. K., & Ball, D. L. (1990). Relations between policy and practice: A commentary. *Educational Evaluation and Policy Analysis*, *12* (3), 249–256.

Friel, S. N., Ball, D. L., Cooney, T. J., & Lappan, G. (1990). Envisioning change in the practice of mathematics teaching: The NCTM's *Professional Standards for Teaching Mathematics*. *School Science and Mathematics, 90* (6), 510–515.

Ball, D. L. (1988). Unlearning to teach mathematics. *For the Learning of Mathematics*, *8* (1), 40–48.

Ball, D. L., & Feiman-Nemser, S. (1988). Using textbooks and teachers' guides: A dilemma for beginning teachers and teacher educators. *Curriculum Inquiry*, *18*, 401–423.

Ball, D. L., & McDiarmid, G. W. (1988). Research on teacher learning: Studying how teachers' knowledge changes. *Action in Teacher Education*, *10* (2), 17–24.

Selected Book Chapters

Lewis, J., & Ball, D. L. (2009). Defining the problem of equity in teaching elementary school mathematics. In D. Featherman, M. Hall, & M. Krislov (Eds.), *The Next 25 Years? Affirmative Action and Higher Education in the United States And South Africa.* Ann Arbor, MI: University of Michigan Press.

Ball, D. L., & Hill, H. C. (2008). Measuring teacher quality in practice. In D. H. Gitomer (Ed.), *Measurement issues and assessment for teaching quality*. (pp. 80–98). Thousand Oaks, CA: SAGE Publications.

Ball, D. L., & Bass, H. (2008). The role of mathematics in education for democracy. In G. Fenstermacher (Series Ed.) & D. Coulter, & J. Wiens (Vol. Eds.), *Yearbook of the National Society for the Study of Education: Vol. 107* (1). *Why do we educate in a democratic society?* (pp. 171-184). Malden, MA: Blackwell Publishing.

Hill, H., Sleep, L., Lewis, J. & Ball, D. L. (2007). Assessing teachers' mathematical knowledge: What knowledge matters and what evidence counts? In F. Lester (Ed.), *Handbook of Research on Mathematics Education (2nd ed.)* (pp. 111–155). Charlotte, NC: Information Age Publishing.

Cohen, D. K. & Ball, D. L. (2007). Innovation and the problem of scale. In B. Schneider & S. McDonald (Eds.) *Scale-Up In Education: Ideas in Principle (Volume I)*, (pp. 19–36). Lanham, MD: Rowman & Littlefield. An earlier draft of this paper was presented at a 2003 meeting ("Conceptualizing Scale-Up"), sponsored by the Data Research and Development Center of The University of Chicago, and supported by the National Science Foundation, in connection with the Interagency Research Initiative (IERI).

Boaler, J., Ball, D. L., & Even, R. (2003). Preparing researchers for disciplined inquiry: Learning from, in, and for practice. In A. Bishop & J. Kilpatrick (Eds.), *International Handbook of Mathematics Education* (pp. 491–521). Dordrecht: Kluwer.

Ball, D. L. (2003). What do we believe about teacher learning, and how can we learn with and from our beliefs? In D. Mewborn (Ed.), Proceedings of the 2002 *Annual Meeting of the Psychology of Mathematics Education–North American Chapter*.

Ball, D. L, & Bass, H. (2003). Toward a practice-based theory of mathematical knowledge for teaching. In B. Davis & E. Simmt (Eds.), *Proceedings of the 2002 Annual Meeting of the Canadian Mathematics Education Study Group* (pp. 3–14). Edmonton, AB: CMESG/GCEDM.

Ball, D. L., & Bass, H. (2003). Making mathematics reasonable in school. In G. Martin (Ed.), *Research compendium for the Principles and Standards for School Mathematics* (pp. 1–39). Reston, VA: National Council of Teachers of Mathematics.

Ball, D. L. (2002). What does it take to (teach to) reason in the primary grades? In *Proceedings for the International Congress of Mathematicians* (pp. 908–911). Beijing, China: Higher Education Press.

Cohen, D. K., Raudenbush, S., & Ball, D. L. (2002). Resources, instruction, and research. In Boruch, R. & Mosteller, F. (eds.) *Evidence matters: Randomized trials in education research* (pp. 80–119). Brookings Institute.

Ball, D. L. (2001). Teaching with respect to mathematics and students. In T. Wood & B. Scott Nelson (Eds.) *Beyond classical pedagogy: Teaching elementary school mathematics* (pp. 11–22). Hillsdale, NJ: Erlbaum.

Ball, D. L., Lubienski, S., & Mewborn, D. (2001). Research on teaching mathematics: The unsolved problem of teachers' mathematical knowledge. In V. Richardson (Ed.), *Handbook of research on teaching* (4th ed., pp. 433–456). New York: Macmillan.

Ball, D. L., & Bass, H. (2000). Interweaving content and pedagogy in teaching and learning to teach: Knowing and using mathematics. In J. Boaler (Ed.), *Multiple perspectives on the teaching and learning of mathematics* (pp. 83–104). Westport, CT: Ablex.

Ball, D.L. (2000). Foreword. In Stein, M.K., M.S. Smith, M.A. Henningsen, & E. Silver, *Implementing standards-based mathematics instruction: A casebook for professional development.* New York: Teachers College Press. (pp. ix–xiv).

Ball, D. L. (2000). Working on the inside: Using one's own practice as a site for studying mathematics teaching and learning. In A. Kelly. & R. Lesh (Eds.), *Handbook of research design in mathematics and science education* (pp. 365–402). Dordrecht, Netherlands: Kluwer.

Ball, D. L., & Bass, H. (2000). Making believe: The collective construction of public mathematical knowledge in the elementary classroom. In D. Phillips (Ed.), Yearbook of the National Society for the Study of Education*, Constructivism in Education* (pp. 193**–**224). Chicago: University of Chicago Press.

Ball, D. L. (1999). Crossing boundaries to examine the mathematics entailed in elementary teaching. In T. Lam (Ed.), *Contemporary Mathematics* (pp. 15**–**36). Providence: American Mathematical Society.

Ball, D. L. & Cohen, D. K. (1999). Developing practice, developing practitioners: Toward a practice-based theory of professional education. In G. Sykes & L. Darling-Hammond (Eds.), *Teaching as the learning profession: Handbook of policy and practice* (pp. 3–32). San Francisco: Jossey Bass.

Ball, D. L. & Lampert, M. (1999) Multiples of evidence, time, and perspective: Revising the study of teaching and learning. In E. Lagemann & L. S. Shulman (Eds.), *Issues in education research: Problems and possibilities* (pp. 371–398). San Francisco: Jossey Bass.

Lampert, M. & Ball, D. L. (1999). Aligning teacher education with contemporary K-12 reform visions. In G. Sykes & L. Darling-Hammond (Eds.), *Teaching as the learning profession: Handbook of policy and practice* (pp. 33–53). San Francisco: Jossey Bass.

Ball, D. L. (1997) What do students know? Facing challenges of distance, context, and desire in trying to hear children. In B. Biddle, T. Good, & I. Goodson (Eds.), *International handbook on teachers and teaching* (Vol. II, pp. 679–718). Dordrecht, Netherlands: Kluwer Press.

Ball, D. L. (1997). Developing mathematics reform: What don't we know about teacher learning—but would make good working hypotheses? In S. Friel & G. Bright (Eds.), *Reflecting on our work: NSF Teacher Enhancement in K-6 Mathematics* (pp. 77–111). Lanham, MD: University Press. (Previously published as Ball, D. L. (1995). *Developing mathematics reform: What don't we know about teacher learning—but would make good working hypotheses*? [Craft Paper 95–4]. East Lansing: Michigan State University, National Center for Research on Teacher Learning.)

Comiti, C., & Ball, D.L. (1996). Preparing teachers to teach mathematics: A comparative perspective. In A. Bishop & C. Kreidt-Keitel (Eds.), *International Handbook on mathematics education* (pp. 1123–53). Dordrecht, Netherlands: Kluwer Press.

Ball, D.L. (1995). Connecting to mathematics as part of learning to teach. In D. Schifter (Ed.), *What's happening in math class? Vol. 2: Reconstructing professional identities* (pp. 36–45). New York: Teachers College Press.

Ball, D. L. (1993). Moral and intellectual, personal and professional: Restitching practice. In M. Buchmann & R. E. Floden, *Detachment and concern: Topics in the philosophy of teaching and teacher education* (pp. 193–204). New York: Teachers College Press.

Ball, D. L. (1993). Preface. In D. Schifter and C. Fosnot, *Reconstructing mathematics education: Stories of teachers meeting the challenge of reform*. New York: Teachers College Press.

Ball, D. L. (1993). Halves, pieces, and twoths: Constructing representational contexts in teaching fractions. In T. Carpenter, E. Fennema, & T. Romberg, (Eds.), *Rational numbers: An integration of research* (pp. 157–196). Hillsdale, NJ: Erlbaum.

Ball, D. L. & Rundquist, S. (1992). Collaboration as a context for joining teacher learning with learning about teaching. In D. K. Cohen, M. McLaughlin, & J. Talbert, (Eds.), *Teaching for understanding: Challenges for practice, research, and policy* (pp. 13–42). San Francisco: Jossey Bass.

Ball, D. L. (1992). The permutations project: Mathematics as a context for learning about teaching. In S. Feiman-Nemser and H. Featherstone (Eds.), *Exploring teaching: Adventures of teachers and students in an introductory teaching class* (pp. 18–33). New York: Teachers College Press.

Ball, D. L. (1992). Teaching mathematics for understanding: What do teachers need to know about the subject matter? In M. Kennedy (Ed.), *Teaching academic subjects to diverse learners* (pp. 63–83). New York: Teachers College Press.

Ball, D. L. (1991). Research on teaching mathematics: Making subject matter part of the equation. In J. Brophy (Ed.), *Advances in research on teaching* (Vol. 2, pp. 1–48). Greenwich, CT: JAI Press.

Ball, D. L., & McDiarmid, G. W. (1990). The subject matter preparation of teachers. In W.R. Houston (Ed.), *Handbook of research on teacher education* (pp. 437–449). New York: Macmillan.

McDiarmid, G. W., Ball, D. L., & Anderson, C. W. (1989). Why staying ahead one chapter doesn't really work: Subject-specific pedagogy. In M. Reynolds (Ed.), *The knowledge base for beginning teachers* (pp. 193–205). New York: Pergamon and the American Association of Colleges of Teacher Education.

Selected Papers and Technical Reports

Ball, D. L. & Bass, H. (2009). With an eye on the mathematical horizon: Knowing mathematics for teaching to learners' mathematical futures. Paper prepared based on keynote address at the 43rd Jahrestagung für Didaktik der Mathematik held in Oldenburg, Germany, March 1–4, 2009.

Ball, D. L. (2002, Summer). Knowing mathematics for teaching: Relations between research and practice. In *Mathematics and Education Reform Newsletter*, *14* (3), 1–5.

Rowan, B., Schilling, S. G., Ball, D. L., & Miller, R. (2001) *Measuring teachers' pedagogical content knowledge in surveys: An exploratory study*. (Research Note S-2) Consortium for Policy Research in Education, Study of Instructional Improvement. Ann Arbor: University of Michigan.

Hill, H.C., Siegel, E., & Ball, D. L. (2001, April). *Validating mathematical content.* Paper presented at the annual meeting of the American Educational Research Association, Seattle, WA.

Ball, D. L. (2001, February). *Developing a mathematically proficient public: What are the problems, what do we know about them, and what would it take to solve them*? Paper prepared for the Aspen Institute congressional conference on "Promoting Excellence in the New Economy: The Challenges to National Policy," St. Petersburg, Florida, February 16–19, 2001.

Cohen, D. K., Raudenbush, S., Ball, D. L (2000). *Resources, instruction, and research.* Working paper, Center for Teaching Policy. Seattle: University of Washington. (An earlier version of this paper was presented at the fall meeting of the American Academy of Arts and Sciences, October, 1999.)

Ball, D. L, Camburn, E., Correnti, R., Phelps, G. & Wallace, R. (1999). *New tools for research on instruction: A web-based teacher log.* Working paper, Center for Teaching Policy. Seattle: University of Washington.

Ball, D. L. & Cohen, D. K. (2000). *Challenges of improving instruction: A view from the classroom*. Washington, DC: Council of Basic Education.

Cohen, D. K. & Ball, D. L. (1999). *Instruction, capacity, and improvement*. (CPRE Research Report No. RR-043). Philadelphia, PA: University of Pennsylvania, Consortium for Policy Research in Education.

Darling-Hammond, L. & Ball, D. L. (1998). *Teaching for high standards: What policymakers need to know and be able to do*. Joint publication of the Consortium of Policy Research in Education and the National Commission on Teaching and America's Future, JRE-04.

Ball, D. L. & Cohen, D. K. (1995, April). *What does the educational system bring to learning a new pedagogy of reading or mathematics?* Paper presented at the annual meeting of the American Educational Research Association, San Francisco, CA.

Chazan, D. & Ball, D. L. (1995). *Beyond exhortations not to tell: The teacher's role in discussion-intensive pedagogy*. (Craft Paper 95-2). East Lansing: Michigan State University, National Center for Research on Teacher Learning.

Price, J., Ball, D. L., & Luks, S. (1995). *Marshaling resources for reform: District administrators and the case of mathematics.* (Research Report 95-2). East Lansing: Michigan State University, National Center for Research on Teacher Learning.

Kennedy, M. M., Ball, D. L., & McDiarmid, G. W. (1993). *A study package for examining and tracking changes in teachers' knowledge* (Technical Series 93-1). East Lansing, Michigan: The National Center for Research on Teacher Education.

Ball, D. L. (1992). *Implementing the NCTM standards: Hopes and hurdles*. (Issue Paper 92-2). East Lansing: Michigan State University, National Center for Research on Teacher Learning. (Commissioned paper prepared for conference on Telecommunications as a Tool for Educational Reform: Implementing the NCTM Standards. Aspen Institute, Wye Conference Center, Queenstown, MD.)

Ball, D. L., Lampert, M., & Rosenberg, M. L. (1991, April). *Using hypermedia to investigate and construct knowledge about mathematics teaching and learning*. Paper presented at the annual meeting of the American Educational Research Association, Chicago, IL.

Ball, D. L., & Wilson, S. M. (1990). *Knowing your subject and learning to teach it: Becoming a mathematics teacher.* (Research Report 90-7). East Lansing: Michigan State University, National Center for Research on Teacher Learning.

Lampert, M., & Ball, D. L. (1990). *Using hypermedia technology to support a new pedagogy of teacher education.* (Issue Paper 90-5). East Lansing: Michigan State University, National Center for Research on Teacher Education.

Books

Even, R. & Ball, D. L. (Eds.). (2009). *The professional education and development of teachers of mathematics: The 15th ICMI study*. New York: Springer.

Lampert, M. & Ball, D. L. (1998). *Mathematics, teaching, and multimedia: Investigations of real practice*. New York: Teachers College Press.

Articles in the Media or on Blogs

Ball, D. L. (2011). Can Teachers Make a Difference? *Huffington Post*. Retrieved from http://www.huffingtonpost.com/Deborah%20Loewenberg%20Ball/teachers-make-a-difference_b_817096.html.

Ball, D.L. (2011). The Cost of Education Wars. *Huffington Post*. Retrieved from http://www.huffingtonpost.com/Deborah%20Loewenberg%20Ball/the-cost-of-education-war_b_801722.html.

Ball, D.L. (2009) Force Teachers to Prove Skills. *Detroit News.* Retrieved from www.detnews.com/article/20090430/Force-teachers-to-prove-skills (archived).

SELECTED MAJOR PRESENTATIONS AND ADDRESSES (1998 – 2015)

(2015, October). What does it mean to be "safe to practice"? And what is advanced professional capability? Invited plenary at NEA Foundation's 9th Annual Cross-Site Convening, Washington, DC.

(2015, June). Helping students to persevere with challenging mathematics. International Commission on Mathematics Instruction, Study 23. Macau, China.

(2015, June). What does it take to prepare mathematics teachers for responsible entry-level practice? Presentation at the MTE-Partnership Annual Conference, Fullerton, CA.

(2015, April). What would it take to build a system that could prepare mathematically and pedagogically skillful teachers at scale? Invited presentation at the Mathematical Sciences Research Institute's (MSRI's) policy workshop, Washington, DC.

(2015, February). Raising the quality of teacher preparation: It's a window of opportunity. Invited plenary at the American Association of State Colleges and Universities' Academic Affairs Winter Meeting, New Orleans, LA.

(2015, January). Supporting the high quality teaching of mathematics: Balancing the equation. Invited keynote at the Scholastic Mathematics Leadership Summit, San Francisco, CA. (2014, November). Developing great teaching: From responsible entry to advanced practice. Invited plenary at the Education Trust National Conference, Baltimore, MD.

(2014, November). Why is skillful mathematics teaching so important and (how) could the U.S. supply it at scale? Hugo Rossi Lecture at the University of Utah, Salt Lake City, UT.

(2014, October). Our young people can't be left to chance: Making responsible entry-level teaching the norm. Keynote address for the Education Writers Association, Detroit, MI.

(2014, October). Our young people can't be left to chance: Making responsible entry-level teaching the norm. Plenary address at the Michigan Association of Colleges of Teacher Education (MACTE) Fall Conference, Saginaw, MI.

(2014, June). Why good teaching is both unnatural and crucial, and what it would take to supply it at scale? Invited presentation for the Forum for the Future of Higher Education's Aspen Symposium, Aspen, CO.

(2014, June). Developing teachers' mathematical knowledge for teaching. Invited presentation for the University of South Australia (via web conference).

(2014, May). A curriculum and pedagogy to prepare teachers for responsible beginning practice. Invited presentation at the MOFET Institute, Tel Aviv, Israel.

(2014, May). (For what and to whom) should teacher preparation hold ourselves accountable? Keynote address at the Educational Testing Services' Praxis Client Conference, Princeton, NJ.

(2014, April). Teaching instead of requesting: What is involved in making complex mathematical work explicit? Invited major session at the National Council of Supervisors of Mathematics (NCSM) Annual Conference, New Orleans, LA.

(2014, March). Making skillful teaching an entitlement: (How) could the U.S. do this? Dean's Distinguished Lecture at Harvard Graduate School of Education, Cambridge, MA.

(2014, March). What does it mean to be “safe to practice”? And what is advanced professional capability? Invited presentation at the National Board for Professional Teaching Standards’ Teaching & Learning Conference, Washington, DC.

(2014, March). It's a moral imperative: Skillful teaching can't be left to chance. Invited presentation at the Albert Shanker Institute and American Federation of Teachers, Washington, DC.

(2014, March). (For what and to whom) should teacher preparation hold ourselves accountable? Keynote address at the 66th Annual Meeting of the American Association of Colleges for Teacher Education (AACTE), Indianapolis, IN.

(2014, January). Practices of using video records as a resource in teacher education. Invited presentation at the Weizmann Institute of Science, Rehovot, Israel.

(2013, December). Supporting the high quality teaching of mathematics: Balancing the equation. Invited keynote at the Scholastic Mathematics Summit. Miami, FL.

(2013, December). Building the teaching profession: A national imperative. Keynote address at the Network of Michigan Educators’ Recognition Banquet, East Lansing, MI.

(2013, November). It's a moral imperative: Skillful teaching can't be left to chance. Invited seminar at the Center for Research on Educational Opportunity, Institute for Educational Initiatives, University of Notre Dame, Notre Dame, IN.

(2013, November). “Safe to practice” as the standard for licensure. Keynote address at the 2013 National edTPA Implementation Conference, San Diego, CA.

(2013, October). Toward responsible beginning teaching. Billie Grace Goodrich Distinguished Lecture at the University of Tennessee, Knoxville, TN.

(2013, October). It's a moral imperative: Skillful teaching can't be left to chance. Presentation at the University of Delaware College of Education and Human Development, Newark, DE.

(2013, August). Great teachers aren’t born, they’re taught. Presentation at the Center for American Progress, Washington, DC.

(2013, August). (How) can all children get great teaching? Keynote address at the Michigan Department of Education's Bureau of Assessment and Accountability Fall Conference, Saginaw, MI.

(2013, July). How can we advance teaching? Improving students’ learning through high-leverage practices of instruction. Keynote address at the Carnegie Foundation for the Advancement of Teaching’s Pathways National Forum, Santa Cruz, CA.

(2013, June). Putting American schools back to work: The Michigan model scales up. Presentation to the Wolverine Caucus, Lansing, MI.

(2013, June). (How) can all children get great teaching? Keynote address at the 85th Annual National Association of State Directors of Teacher Education and Certification (NASDTEC) Conference, Austin, TX.

(2013, May). Hopelessly American: The challenge of responsible democratic education. Invited colloquium at Stanford Graduate School of Education, Stanford, CA.

(2013, April). (How) can all children get great teaching? Presentation at the National Board for Professional Teaching Standards' Board of Directors Meeting, Washington, DC.

(2013, March). (How) can we assess teaching to support improvement in practice. Keynote address at the Tri-County Alliance for Public Education's Spring Meeting, Novi, MI.

(2013, February). (How) can we assess teaching to support improvement in practice? Keynote address at the 52nd Annual Michigan State Testing Conference, Ann Arbor, MI.

(2013, February). Teaching all students to be mathematically skillful: Balancing the equation. Invited keynote at the Scholastic Mathematics Summit, Vanderbilt University, Nashville, TN.

(2012, November). Great teachers aren't born. They're taught. Keynote address to the National Council for Curriculum and Assessment and Marino Institute of Education, Dublin, Ireland.

(2012, October). (How) Can all children get great teaching? Presentation at the University of Iowa, Iowa City, IA.

(2012, September). Tackling inequity by teaching to teach: Focusing on high-leverage practices. Keynote address at the Fall 2012 CAEP Conference, Washington, D.C.

(2012, September). The Common Core State Standards: Teaching to learn and learning to teach. Invited panel at the Society for Research on Educational Effectiveness, Washington, DC.

(2012, July). Challenges of knowing mathematics for teaching in the United States. Invited presentation at the 12th Annual International Congress on Mathematical Education, Seoul, Korea.

(2012, April). Teaching works. Keynote address at the Governor's Summit on Education in Michigan, Lansing, MI.

(2012, April). Practicing the common core: What is the work of teaching? Invited presentation at the National Council of Supervisors of Mathematics (NCSM) Annual Conference, Philadelphia, PA.

(2012, February). (How) Can mathematics teaching be taught? Invited address as the recipient of the Excellence in Teaching Award from the Association of Mathematics Teacher Educators, Fort Worth, Texas.

(2011, November). Hopelessly American: The challenge of reforming education. Invited Brodie Lecturer, Bowdoin College, Maine.

(2011, September). Great teachers are not born, they're taught. Invited keynote address to the Cotsen Foundation for the Art of Teaching annual professional meeting, Los Angeles, CA.

(2012, July). Invited presentation at the summer meeting of the Chief State School Officers, Phoenix, AZ.

(2011, June). Learning to teach something in particular. Invited keynote address at the annual meeting of the National Association of State Directors of Teacher Education and Certification. Sacramento, CA.

(2011, May). (w/ Steven Farr and Pamela Grossman). Does teacher education have a future? Invited Cubberley lecture/panel, Stanford University, Palo Alto, CA.

(2011, March). (w/ H. Bass). Knowing mathematics well enough to teach it: Mathematical knowledge for teaching (MKT). Invited colloquium, College of Education, University of Texas-Austin, Austin, TX.

(2011, March). Supporting high-quality mathematics instruction. Presentation at the Scholastic Mathematics Leadership Summit, Boston, MA.

(2011, February). Assessing teaching practice for learning and licensure. Invited Frank B. Womer lecture to the 51st Annual Michigan School Testing Conference, Ann Arbor, MI.

(2011, February). "Scaling up" as a problem of education practice. Invited lecture at the Mandel Leadership Institute, Jerusalem, Israel.

(2011, February). Knowing mathematics well enough to teach it: Mathematical knowledge for teaching (MKT). Invited presentation to the Israel Academy of Sciences and Humanities, Jerusalem, Israel.

(2010, October). Supporting high-quality mathematics teaching. Presentation at the Scholastic Mathematics Leadership Summit, Boston, MA.

(2010, September). The role of colleges of education in research-intensive universities. Invited address to opening meeting of the University of Georgia College of Education, Athens, GA.

(2010, August). (w/ F. Forzani). Building a system for teacher training in the U.S. Presentation at the summer meeting of the State Higher Education Executive Officers (SHEEO), Providence, RI.

(2010, July). The elephant in the room: Building a system for developing effective teachers. Presentation at the Summer Institute of the Council of Chief State School Officers (CCSSO), Minneapolis, MN.

(2010, May). (w/ F. Forzani). Design problems in practice-centered teacher education. Presentation at the Annual Meeting of the American Educational Research Association (AERA), Denver, CO.

(2010, April). Learning to do mathematics as a teacher. Presentation at the National Council of Supervisors of Mathematics (NCSM) Annual Conference, San Diego, CA.

(2010, April). How can we get good teaching for all students? Presentation at the Scholastic Intervention Convention 2010, Boca Raton, FL.

(2009, November). What can we gain by conducting disciplined inquiry into teaching practice? Presentation at the Association for the Study of Higher Education Annual Meeting, Vancouver, Canada.

(2009, October). Expanding who is "good at math" from the beginning. Presentation at the Seyhan N. Eğe Memorial Symposium, Ann Arbor, MI.

(2009, October). Improving mathematics and science education: Making change work. Presentation at the inaugural event for the University of Utah's Center for Science and Mathematics Education, Salt Lake City, UT.

(2009, June). The special work of knowing and doing mathematics in teaching. Invited keynote address to the annual meeting of the Association of Mathematics Educators of South Africa (AMESA), University of the New Free State, Bloemfontein, South Africa.

(2009, June). Developing teachers' mathematical knowledge for teaching. Invited plenary session to the annual meeting of the Association of Mathematics Educators of South Africa (AMESA), University of the New Free State, Bloemfontein, South Africa.

(2009, June). Making mathematics learnable in school: What is the work of teaching mathematics? Invited plenary address to the 3rd International Redesigning Pedagogy Conference, National Institute of Education, Singapore.

(2009, May). Making progress in mathematics education: Lessons past, present, and future. Invited colloquium to the Department of Mathematics, Brigham Young University, Provo, Utah.

(2009, April). (Why) should research universities have schools of education? Invited Spencer Lecture at the annual meeting of the American Educational Research Association, San Diego, CA.

(2009, March). (w/ H. Bass). Mit einem Auge auf den mathematischen Horizont: Was der Lehrer braucht für die Zukunft seiner Schüler. Invited keynote address to the 43. Jahrestagung für Didaktik der Mathematik. Oldenburg, Germany. Also presented at the 2009 Curtis Center Mathematics and Teaching Conference, Department of Mathematics, University of California at Los Angeles (February 2009).

(2009, February). Becoming a nation of mathematically literate people: What will it take? Invited keynote address to the 49th annual Michigan School Testing Conference, Ann Arbor, MI.

(2008, October). Teachers and teacher education: The National Mathematics Advisory Panel report. Presentation at the National Mathematics Panel Forum, Washington, DC.

(2008, June). (w/ H. Bass). Proving the impossible. Distinguished Lecturer Series presentation at San Diego State University, San Diego, CA.

(2008, June). (w/ H. Bass). Improving U.S. mathematics education: History, myths, and strategies. Distinguished Lecturer Series presentation at San Diego State University, College of Sciences, San Diego, CA.

(2008, May). Opening and closing presentation made at the Mathematical Sciences Research Institute's Critical Issues in Education Workshop: Teaching and Learning Algebra, Berkeley, CA.

(2008, April). (w/ R. Gersten). The National Mathematics Advisory Panel Report: Major themes and implications for special education. Presentation made at the Council for Exceptional Children conference, Boston, MA.

(2008, April). (w/ H. Bass). Proving the impossible. Invited presentation made at the National Council of Teachers of Mathematics Annual Meeting, Salt Lake City, UT.

(2008, April). (w/ I. Goffney, C. Malloy, and D. White). Equitable instruction in mathematics: Learning to develop practitioners. Panel presentation and discussion at the National Council of Teachers of Mathematics Research Presession, Salt Lake City, UT.

(2008, April). (w/ H. Bass, J. Lewis, L. Sleep, K. Suzuka, A. Babson, J. Jacobs, Y. Kim, M. Thames, and D. Zopf). Designing and using problems to teach mathematical knowledge for teaching. Presentation made at the National Council of Teachers of Mathematics Research Presession, Salt Lake City, UT.

(2008, April). Building professional education for teaching mathematics: Meeting the challenges. Presentation made at the National Council of Supervisors of Mathematics Annual Conference, Salt Lake City, UT.

(2008, April). (w/ T. Boerst, L. Sleep, and Y. Cole). Learning practice through practice: Design considerations of a practice-based course. Presentation made at the National Council of Teachers of Mathematics Research Presession, Salt Lake City, UT.

(2008, March). Mathematical knowledge for teaching: Explicating and examining a program of research. Presentation made at the annual meeting of the American Educational Research Association, New York, NY.

(2008, February). The work of teaching and the challenge for teacher education. The 2008 Charles W. Hunt Lecture at the annual meeting of the American Association of Colleges of Teacher Education, New Orleans, LA.

(2008, January). (w/ T. Boerst, L. Sleep, and Y. Cole). Practice as evidence of learning: Using performance assessments in a methods course. Presentation made at the annual meeting of the Association of Mathematics Teacher Educators (AMTE), Tulsa, OK.

(2007, November). Improving mathematics learning: Where are we and where do we need to head? Presentation to the Carnegie/IAS Commission on Mathematics and Science Education, New York, NY.

(2007, September). (w/ H. Hill). Measuring teacher quality in practice. Measurement Challenges and the Assessment of Teacher Quality, Presentation at the Educational Testing Service 2007 Conference, San Francisco, CA.

(2007, September). What makes education research "educational"? Invited colloquium at the Learning Policy Center, University of Pittsburgh, Pittsburgh, PA.

(2007, April). The case for ed schools, and the challenge. The DeWitt Wallace-Reader's Digest Distinguished Lecture at the annual meeting of the American Educational Research Association, Chicago, IL.

(2007, April). (w/ H. Bass, S. Delaney, D. Earnest, I. Goffney, G. Saxe, M. Shaughnessy, L. Sleep, and K. Suzuka). The laboratory class: A multidisciplinary approach to studying the teaching and learning of mathematics. Presentation made at the annual meeting of the American Educational Research Association, Chicago, IL.

(2007, March). (w/ R.J. Milgram, and R. Schaar). Next steps in finding a common ground in grades K-12 mathematics education. Presentation made at the annual meeting of the National Council of Teachers of Mathematics, Atlanta, GA.

(2007, March). Getting to practice: Challenging the conceptual fallacies that interfere with professional work. Presentation made at the annual meeting of the National Council of Teachers of Mathematics, Atlanta, GA.

(2007, March). (w/ T. Boerst, and L. Sleep). Learning to do the work of teaching in a practice-based methods course. Presentation made at the research presession of the annual meeting of the National Council of Teachers of Mathematics, Atlanta, GA.

(2007, March). Teaching mathematics as an unnatural activity. Presentation made at the annual meeting of the National Council of Supervisors of Mathematics (NCSM), Atlanta, GA.

(2007, March). (w/ H. Bass, T. Boerst, J. Lewis, L. Sleep, K. Suzuka, and M. Thames). Learning mathematical knowledge for teaching: Opportunities grounded in practice. Presentation made at the research presession of the annual meeting of the National Council of Teachers of Mathematics, Atlanta, GA.

(2007, February). (w/ H. Bass, S. Delaney, I. Goffney H. Hill, J. Lewis, G. Phelps, L. Sleep, and M. Thames). Knowing your subject well enough to teach it: What more does it take? Presentation at the Network Connections Conference, Pittsburgh, PA.

(2007, January). (w/ L. Sleep). How does mathematical language figure in the work of teaching? How does this shape mathematical knowledge for teaching (MKT) and teacher education? Presentation made at the annual meeting of the Association of Mathematics Teacher Educators (AMTE), Irvine, CA.

(2007, January). What kind of mathematical work is teaching, and how does it shape a core challenge for teacher education? Judith E. Jacobs Lecture given at the annual meeting of the Association of Mathematics Teacher Educators (AMTE), Irvine, CA.

(2007, January). (w/ H. Bass, T. Boerst, J. Lewis, L. Sleep, K. Suzuka, and M. Thames). Learning mathematics in and for practice: Using records of practice as (con)texts for learning mathematical knowledge for teaching. Presentation made at the annual meeting of the Association of Mathematics Teacher Educators (AMTE), Irvine, CA.

(2007, January). (w/ L. Sleep). What is Mathematical Knowledge for Teaching, and what are features of tasks that can be used to develop MKT? Presentation made at the Center for Proficiency in Teaching Mathematics (CPTM) presession of the annual meeting of the Association of Mathematics Teacher Educators (AMTE), Irvine, CA.

(2007, January). (w/ H. Bass and L. Sleep). How have we been using what we learned from the Summer Institute in our work? Presentation made at the Center for Proficiency in Teaching Mathematics (CPTM) presession of the annual meeting of the Association of Mathematics Teacher Educators (AMTE), Irvine, CA.

(2006, November). (w/ J. Lewis). Meeting the mathematical challenges of making connections. Presentation made at the annual meeting of the California Mathematics Council (CMC) Southern Section, Palm Springs, CA.

(2006, May). (w/ H. Bass, H. Hill, and M. Thames). What is special about knowing mathematics for teaching and how can it be developed? Presentation made at the Teachers' Program and Policy Council of the American Federation of Teachers, Washington, DC.

(2006, May). (w/ H. Bass). What is special about knowing mathematics for teaching and how can it be developed? Presentation made at the Chancellor's Mathematics Advisory Panel, New York City Public Schools, New York, NY.

(2006, April). (w/ H. Bass, I. Goffney, and L. Sleep). Exploring the use of mathematical language in teaching: What do teachers need to know? Presentation made at the annual meeting of the National Council of Teachers of Mathematics, St. Louis, MO.

(2006, April). (w/ H. Bass and I. Goffney). The role of mathematical language in learning and succeeding in mathematics. Presentation made at the annual meeting at the Association of State Supervisors of Mathematics, St. Louis, MO.

(2006, April). Stepping up, breaking it down: The problem of teacher preparation in the United States. Presentation to the Michigan House Education Committee, Lansing, Michigan.

(2006, April). The role of mathematics in learning to participate in a diverse democracy. Invited Kieval lecture at Humboldt State University, Arcata, CA.

(2006, March). Who knows math well enough to teach third grade—and how can we decide? Presentation to the Wolverine Caucus, Lansing, MI.

(2006, March). (w/ H. Bass). Mapping the domain of mathematical knowledge for teaching: Knowing and using mathematics as a teacher. Keynote address at the Excellence in Teaching Science and Mathematics Symposium, Loyola University, Chicago, IL.

(2006, January). (w/ L. Sleep). Knowing and using mathematics in teaching. Invited address to the Learning Network Conference, Mathematics and Science Partnerships Program, National Science Foundation, Washington, DC.

(2005, December). (w/ H. Bass). The teaching and learning of reasoning and proof in school. Invited address to the National Conference on Mathematics Education, NCERT, Delhi, India.

(2005, October). Knowing mathematics for teaching. Invited address to the NCATE General Assembly, Washington, DC.

(2005, August). (w/ H. Bass). Teaching for mathematics learning. Invited lecture at The Future of Mathematics Learning conference, Ströbl, Austria.

(2005, April). (w/ H. Hill). Knowing mathematics as a teacher. Invited major presentation at the annual meeting of the National Council of Teachers of Mathematics, Anaheim, CA.

(2005, April). Learning the mathematical work of teaching. Invited major presentation at the annual meeting of the National Council of Supervisors of Mathematics, Anaheim, CA.

(2005, April). Who knows mathematics well enough to teach it? Invited major presentation at the annual meeting of the Association of State Supervisors of Mathematics, Anaheim, CA.

(2005, March). Who knows mathematics well enough to teach third grade? First Annual Richard Andrews Lecture at the University of Missouri College of Education, Columbia, MO.

(2005, March). (w/ H. Hill). Studying instructional improvement. Invited colloquium to the RAND Corporation, Santa Monica, CA.

(2005, February). The role of mathematics in learning to participate in a diverse democracy. Invited lecture in the Distinguished Thinkers' lecture series at the University of California, Davis, CA.

(2005, February). (w/ H. Bass). Knowing mathematics for teaching. Invited colloquium at the Department of Mathematics, Cornell University, Ithaca, NY.

(2005, February). (w/ H. Bass, H. Hill, and S. Schilling). Developing measures of mathematical knowledge for teaching. Presentation at the Teachers Development Group Leadership Seminar, Mathematics Professional Development, Portland, OR.

(2005, February). (w/ H. Bass and K. Suzuka). The professional development of professional developers: Supporting the learning of mathematics teacher educators. Presentation at the Teachers Development Group Leadership Seminar, Mathematics Professional Development, Portland, OR.

(2005, February). (w/ H. Bass). Learning mathematics for teaching: Re-designing "content courses" for teachers. Presentation at the Teachers Development Group Leadership Seminar, Mathematics Professional Development, Portland, OR.

(2005, January). (w/ B. Allen, H. Bass, A. Castro, D. Coffey, T. McMahon, L. Sleep, and P. Sztajn). The professional development of professional developers: Continuing to learn as mathematics teacher educators. Pre-conference work session to the Association of Mathematics Teacher Educators, Dallas, TX.

(2005, January). Using mathematical knowledge for teaching: Putting equity into the equation. Invited keynote address at the MET Summit II, Follow-Up Conference, Atlanta, GA.

(2004, November). Knowing what we "know" in-forming policy and practice: The case of mathematics. Invited address at the Connecting Research, Practice, and Policy in Mathematics and Science Education conference, Racine, WI.

(2004, May). (w/ H. Bass). Disciplinary knowledge and teaching: Knowing what matters. Invited university-wide lecture at the University of Witwatersrand, Johannesburg, South Africa.

(2004, May). Studying instructional improvement. Colloquium at the School of Education, University of Witwatersrand, Johannesburg, South Africa.

(2004, April). What are teachers learning? Invited plenary address to the National Council of Supervisors of Mathematics, Philadelphia, PA.

(2004, March). The university and the good life: Lessons learned in third grade. University Honors Convocation Address, University of Michigan, Ann Arbor, MI.

(2004, February). Making mathematics reasonable. Invited plenary address to Mathematics in Action conference, Grand Valley State University, Grand Rapids, MI.

(2004, February). (w/ H. Bass, M. Hoover, L. Sleep). Knowing mathematics for teaching: Seeing teaching as mathematical work. Invited talk to California State University-Northridge, Northridge, CA.

(2004, January). Knowing and using mathematical knowledge in teaching: Learning what matters. Invited plenary address to the Southern African Association of Mathematics, Science, and Technology Education, Cape Town, South Africa.

(2003, December). (w/ H. Bass). Giving definition to the teaching and learning of mathematics. Invited keynote address to the Canadian Mathematical Society, Vancouver, Canada.

(2003, October). Uncovering the mathematics while covering the curriculum. Invited plenary address to the Primary Mathematics Teachers' Association of Ireland, Dublin, Ireland.

(2003, June). What mathematics is needed for teaching? Invited presentation at the conference, Why Content Matters: Breaking the Link Between Poverty and Achievement, Washington, DC.

(2003, May). (w/ H. Bass). Learning mathematics for teaching. Invited plenary address to the Canadian Mathematics Society Forum on Education, Montréal, Université de Québec, Québec, Canada.

(2003, May). Using content knowledge in teaching: What do teachers have to do, and therefore have to learn? Invited keynote address at the Virtual Conference on Sustainability for Local Systemic Change, NSF Local Systemic Initiatives, TERC.

(2003, May). (w/H. Bass). Knowing mathematics for teaching. Invited plenary address at the international conference on preparing mathematics teachers, Preparation of Mathematics Teachers for the Future Education and Competence Development, Malmö, Sweden.

(2003, May). Preparing teachers for the mathematical work of teaching. Invited plenary address at the annual meeting of the Michigan Chapter of the Mathematical Association of American (MAA), Saginaw Valley, MI.

(2003, April). Learning mathematics for teaching. Invited plenary address to the National Council of Supervisors of Mathematics, San Antonio, TX.

(2003, February). (w/ H. Bass). Roles for mathematicians in mathematics education research and development. Invited plenary address at the conference, Mathematics Education and Mathematics in the 21st Century: The Roles of Outreach, Teacher Preparation, and Research on Teaching and Learning in a Research I Mathematics Department, University of Arizona, Tucson, AZ.

(2003, February). What mathematical knowledge is needed for teaching? Invited presentation at the Secretary's Summit on Mathematics, U.S. Department of Education, Washington, DC.

(2002, October). What do we believe about teacher learning and how can we learn with and from our beliefs? Invited plenary address at the annual conference of the Psychology of Mathematics Education, Athens, GA.

(2002, September). The policy context and the implementation of reform: Connecting professional development to professional practice. Invited plenary talk at the conference of the International Council for Science (ICSU) and its Committee on Capacity Building in Science (CCBS), Rio de Janeiro, Brazil.

(2002, August). What does it take to (teach to) reason in the primary grades? Invited paper for the International Congress of Mathematicians, Beijing, China.

(2002, May). (w/ H. Bass). Toward a practice-based theory of mathematical knowledge for teaching. Invited plenary address, Canadian Mathematics Education Study Group, Kingston, ON, May 24, 2002.

(2002, April). Studying teaching: Using practice as a site for professionals' learning. Invited keynote address to the National Council of Supervisors of Mathematics, Las Vegas, NV.

(2001, November). Studying practice to learn in and from experience. Invited keynote address to the California Mathematics Council annual meeting, Pacific Grove, CA.

(2001, November). (w/ H. Bass). Knowing mathematics for teaching: The mathematical problems that teachers have to solve. Invited plenary address at the National Summit on the Mathematical Education of Teachers, Washington, DC.

(2001, July). (w/ D. K. Cohen). Policy for effective classroom practice. Invited plenary session for the Council of Chief State School Officers, Wilmington, NC.

(2001, January). (w/ H. Bass). Using mathematics in teaching: What do teachers and mathematicians need to learn? Invited presentation to the Mathematical Association of American, Joint Winter Meetings 2001, New Orleans, LA.

(2000, December). Developing useful and usable mathematical knowledge for teaching: A case of content-focused and practice-based professional development. Invited all-day presentation to the National Staff Development Council, Atlanta, GA.

(2000, December). (w/ H. Bass and M. Hoover). Developing mathematical knowledge in the classroom: The individual, the collective, and the teacher. Invited keynote address to the California Mathematics Council annual meeting, Pacific Grove, CA.

(2000, November). (w/ H. Bass). Using practice as a site for developing teachers' mathematical knowledge. Invited all-day presentation to the American Mathematical Association of Two-Year Colleges. Chicago, IL.

(2000, July). Bridging practices: Intertwining content and pedagogy in teaching and learning to teach. Invited keynote address to the Mathematics Education Research Group, Fremantle, Australia.

(2000, June). Working across communities and contexts to solve problems of mathematics teaching and learning. Invited keynote address to statewide Convocation on Mathematics and Science Education, University of Nebraska, Lincoln, NE.

(2000, February). Developing useful and usable mathematical knowledge in and for teaching. Invited keynote address to the Association of Mathematics Teacher Educators, Charlotte, NC.

(2000, January). Teacher learning: What do we know? What do we need to learn? Invited address to the National Science Foundation annual meeting of Local Systemic Initiatives, Washington, DC.

(2000, January). (w/ H. Bass). Making believe: The public construction of collective mathematical knowledge. Invited address to the Association of Research in Undergraduate Mathematics Education (ARUME) at the annual joint meeting of the American Mathematical Society and the Mathematical Association of America. Washington, DC.

(1999, November). What is known from research on teaching about mathematics and science instruction? Invited presentation to the Commission on Improving U.S. Mathematics Education for the Twenty-first Century (Chair, Senator John Glenn), Washington, DC.

(1999, November). Challenges of improving instruction: A view from the classroom. Invited major presentation to the Council of Basic Education, Wingspread, WI.

(1999, June). Preparing teachers for knowing and learning in practice. Invited keynote address to the MOFET International Conference on Teacher Education, Beit Berl, Israel.

(1999, April). "Tell me why": What counts as an explanation in math class? Invited major address to the annual meeting of the National Council of Teachers of Mathematics, San Francisco, CA.

(1999, March). Crossing boundaries: Probing the interplay of mathematics and pedagogy in teaching elementary school mathematics. (with Hyman Bass). Invited presentation at the University of Illinois, Champaign, IL and the National Academy of Sciences' Teacher Content Preparation Conference, Washington, DC.

(1999, March). Looking in classrooms: Observing teaching and learning. Invited major presentation to international meeting of education ministers and staff at the World Bank, Washington, DC.

(1998, September). Research on professional development? What works? Invited address to the AFT/NEA Conference on Teacher Quality, Washington, DC.

(1998, April). What is involved in teaching math to little kids? Crossing boundaries to probe the interplay of mathematics and pedagogy in mathematics teaching. Invited address for the Cattell Award, American Educational Research Association, San Diego, CA.

(1998, February). Connecting policy, teaching, and student performance. Distinguished Lecture at the American Association of School Administrators annual meeting, San Diego, CA.

GRANTS AND FELLOWSHIPS

Building MKT Assessment Items and Instructional Tasks to Build Intercommunity Capacity to Develop Teachers' MKT. National Science Foundation, $2,996,550; 7/2015–6/2019. (Co-principal investigator with Mark Thames).

Investigating Simulations of Teaching Practice: Assessing Readiness to Teach Elementary Mathematics. National Science Foundation**,** $449,829, 9/2013–8/2016. (Co-principal investigator with Meghan Shaughnessy and Timothy Boerst).

Building a Professional System for Entry to Beginning Teaching. The Leona M. and Harry B. Helmsley Charitable Trust, $1,100,000, 2014**–**2016. (Co-principal investigator with Francesca Forzani).

Investigating Simulations of Teaching Practice: Assessing Readiness to Teach Elementary Mathematics. National Science Foundation, $450,000, 2013–2015. (Co-Principal Investigator with Timothy Boerst, Meghan Shaughnessy, and Hyman Bass).

Measures of Effective Teaching Project Extension: Developing a Longitudinal Database and a Library of Practice. Gates Foundation, $3,624,085, 2011–2013. (Co-principal investigator with Brian Rowan and Francesca Forzani).

Building Practical Infrastructure for Learning to Teach the Common Core: Video Exemplars, Curriculum Packages, and Assessments. Gates Foundation, $1,999,999, 2012**–**2014. (Co-principal investigator with Francesca Forzani).

Contextual Research and Large Empirical Research — Developing the Theory of Mathematical Knowledge for Teaching (MKT) by Investigating its Nature, Measurement, and Growth. 2010–2014. National Science Foundation, $2,695,570, 2010–2012. (Co-principal investigator with Mark Thames and Laurie Sleep).

The Design of Research-in-Instruction Laboratories (RILabs) as a Foundation for Transforming Education Research. National Science Foundation, $299,972, 2010–2012. (Co-principal investigator with Hyman Bass and Mark Thames).

Developing Teaching Expertise in Elementary Mathematics. Cisco Learning Institute, $1.9 million, 2009–2011 (Co-principal investigator with Kara Suzuka and Tim Boerst).

Using Practice as a Site to Learn Mathematics for Teaching: Developing Materials, Approaches, and Professional Community. National Science Foundation, Teacher Professional Continuum, $1.6 million, 2005–2010 (Co-principal investigator with Kara Suzuka).

Design, Validation, and Dissemination of Measures of Content Knowledge for Teaching Mathematics. National Science Foundation, Mathematics-Science Partnerships Program. $5 million, 2003-08. (Co-principal investigator with Heather Hill.)

Design, Validation, and Dissemination of Measures of Content Knowledge for Teaching Mathematics. National Science Foundation, Mathematics-Science Partnerships Program. $250,000, 2002–03 (Co-principal investigator with Heather Hill.)

Learning Mathematics for Teaching. National Science Foundation, Research on Learning and Education program. $1.8 million, 2002-2005. (Co-principal investigator with Heather Hill.)

Center for Proficiency in Teaching Mathematics, National Science Foundation, Centers for Teaching and Learning program, 2002–present. (Partner with University of Georgia, Co-principal investigator).

Scaling Up Instructional Improvement, Interagency Educational Research Initiative (National Science Foundation, Department of Education, NICHD). (Co-principal investigator with David K. Cohen). $4.2 million, 2002–2005.

Developing a Practice-Based Theory of Mathematics Knowledge for Teaching. National Science Foundation. (Co-principal investigator with Hyman Bass.) $1.8 million, 2001–2004.

Developing Measures of Instructional Improvement. Interagency Educational Research Initiative (National Science Foundation, Department of Education, NICHD). (Principal investigator with co-principal investigators David K. Cohen and Brian Rowan). $4.2 million, 1999–2003.

Crossing Boundaries: Probing the Interplay of Mathematics and Pedagogy in Elementary Mathematics Teaching. The Spencer Foundation, $302,000, 1998–2000.

Study of Instructional Improvement. OERI, Department of Education (through subcontracts from the Consortium for Policy Research (CPRE); Center for the Study of Teaching and Policy (CSTP, University of Washington), and Atlantic Philanthropies. (Co-principal investigator with David K. Cohen and Brian Rowan.) 1996–2005.

Challenges of Teaching Mathematics for Understanding. National Academy of Education and Spencer Foundation Postdoctoral Fellowship, $35,000, 1994–1996.

A Study of Mathematics Reforms in California Classrooms. (Co-principal investigator with D. Cohen, P. Peterson, S. Wilson). National Science Foundation, $2.25 million, 1992–1996.

A Study of Subject-Matter Reforms in Michigan, California, and South Carolina. (Co-principal investigator with D. Cohen, P. Peterson, S. Wilson) Carnegie Corporation and Pew Charitable Trust, $900,000, 1992–1995.

Communication In and About School Mathematics. (Co-principal investigator with M. Lampert). National Science Foundation, $1.7 million, 1992–1996.

Teaching Mathematics for Understanding: Case-Based Elementary Teacher Preparation. (Co-principal investigator with M. Lampert). National Science Foundation, $1.1 million, 1989–1992.

In addition, I was a senior researcher and study director in two OERI awards to the National Center for Research on Teacher Learning, Michigan State University, 1986–1995.

OTHER SELECTED PROFESSIONAL ACTIVITIES AND SERVICE (1998 – 2015)

2015 – Member, Commission on the Future of Undergraduate Education. Appointed by the American Academy of Arts and Sciences.

2013 – Member, National Science Board. Appointed by President Barack Obama.

2012 – 2013 Chair, Michigan Council for Educator Effectiveness. Appointed by Governor Rick Snyder.

2010 – 2012 Member, National Board for Education Sciences. Appointed by President Barack Obama.

2009 – Member, External Visiting Committee, Educational Testing Service, Princeton, NJ.

2009 – Member, External Visiting Committee, University of Pittsburgh School of Education.

2009 Chair, External Academic Program Review Committee Department of Mathematics, University of Arizona.

2006 – Spencer Foundation Board of Directors. Member 2006 –; Vice-Chair, September 2008 – 2011; Chair 2012 –.

2006 – 2008 Member of Presidential National Mathematics Advisory Panel, appointed by Secretary Margaret Spellings, Secretary, U.S. Department of Education.

2003 – Member, Board of Trustees, Mathematical Sciences Research Institute, University of California, Berkeley. Chair of Education Committee of the Board.

2002 – 2005 Member, Provost's Faculty Advisory Committee, University of Michigan, Provost Paul Courant.

2002 – 2007 Member, Editorial Board, *Journal for Research in Mathematics Teacher Education*. Editor, Barbara Jaworksi.

2002 – 2006 Chair, (w/ R. Even). Teacher Education Study, International Commission on Mathematics Instruction.

2001 – 2003 Strategic Education Research Program, member of Instruction Panel. National Research Council.

2000 – 2001 Member, University of Michigan Commission on the Undergraduate Experience.

1999 – 2003 Chair, Mathematics Study Panel, RAND project: Improving the Quality of Educational Research and Development.

1999 – 2000 Member, Commission on Improving U. S. Mathematics Education for the Twenty-first Century (Chair, Senator John Glenn). Appointed by the U. S. Secretary of Education Richard Riley.

1999 – 2003 Member, Editorial Board, *American Educational Research Journal*, Section on Teaching, Learning, and Human Development.

1999 – 2003 Member, Editorial Board, *Mathematics Thinking and Learning*, Editor, Lyn English.

1999 – 2005 Mandel Foundation for Jewish Education in North American, New York. (Gail Dorph, Director). Consultant to several ongoing projects focused on professional development and preservice teacher education in Jewish education.

1999 – 2000 Member, Mathematics Learning Study, National Research Council, National Academy of Sciences. (Study produced book, *Adding it Up: Helping Children Learn Mathematics*.)

1998 – 2003 Member of advisory staff*, Videocases in Professional Development Project*, Nanette Seago and Judith Mumme, Principal Investigators. Member of advisory staff.

AWARDS AND HONORS

Memberships and Fellowships in Honorary Societies

Fellow of the American Academy of Arts and Sciences, elected 2014.

Fellow of the American Educational Research Association, elected 2013.

Fellow of the American Mathematical Society, elected 2012.

Member of the National Academy of Education, elected 2007.

Awards

Doctorate of Humane Letters. Lesley University, 2015.

Medal for Distinguished Service. Teachers College, Columbia University, 2015.

Edward Pomeroy Award for Outstanding Contributions to Teacher Education. American Association of Colleges for Teacher Education, 2014.

Education Research Award. Council of Scientific Society Presidents, 2013.

Excellence in Teaching Award. Association of Mathematics Teacher Education, 2012.

Distinguished Alumni Award, College of Education, Michigan State University, 2010.

Outstanding Article Published in *Journal of Teacher Education*, 2009.

Louise Hay Award for Outstanding Contributions to Mathematics Education. Association for Women in Mathematics, 2009.

Outstanding Contributions to Mathematics Education Award, Michigan Council of Teachers of Mathematics, 2008.

William H. Payne Collegiate Professorship in Education, University of Michigan, 2004 –.

Palmer O. Johnson Award for Best Article Published in an AERA Journal in 2003. American Educational Research Association, 2004.

Arthur F. Thurnau Professor. University of Michigan, 2000 –.

Raymond B. Cattell Early Career Award for Programmatic Research, American Educational Research Association, 1997.

Award for Outstanding Scholarship on Teacher Education. Association of Colleges and Schools of Education in State Universities and Land Grant Colleges and Affiliated Private Universities, 1990.

Outstanding Dissertation Award. College of Education, Michigan State University, 1989.

Doctoral Award for Academic Excellence. College of Education, Michigan State University. 1988.

Excellence-in-Teaching. Michigan State University, 1986.