

## 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

- 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, Ann Arbor, Michigan
- 1996 -            Professor, Educational Studies, University of Michigan.  
Co-principal investigator, Study of Instructional Improvement, CPRE  
Principal investigator, Mathematics Teaching and Learning to Teach project
- 1991 - 1996            Associate professor, Department of Teacher Education, Michigan State  
University.  
Co-principal investigator, Mathematics and Teaching through Hypermedia.  
Co-principal investigator, Education Policy and Practice Study.  
Senior researcher, National Center for Research on Teacher Learning.
- 1988 - 1991            Assistant professor, Department of Teacher Education, Michigan State  
University.  
Senior researcher, National Center for Research on Teacher Education.  
Co-principal investigator, Mathematics and Teaching through Hypermedia.

- 1988 - 1992 Third and fourth grade mathematics teacher, Spartan Village School, East Lansing, Michigan.
- 1982 - 1988 Graduate teaching assistant and instructor: Department of Teacher Education; research assistant. Institute for Research on Teaching, Michigan State University.
- 1975 - 1988 Elementary classroom teacher (grades 1-5). East Lansing Public Schools, East Lansing, MI 48823.

## PROFESSIONAL WRITING

### Selected Journal Articles

- 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*.
- 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.
- 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, 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 Magnus 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

Ball, D. L., & Hill, H. C. (in press). Measuring teacher quality in practice. In D. H. Gitomer (Ed.), *Measurement issues and assessment for teaching quality*. 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 (2<sup>nd</sup> 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 1)*, (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* (4<sup>th</sup> 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., Thames, M.H., & Phelps, G. (2007). Content knowledge for teaching: What makes it special? Manuscript submitted for publication.
- Ball, D. L., Bass, H., & Hill, H. (2004, January). *Knowing and using mathematical knowledge in teaching: Learning what matters*. Paper prepared for Southern African Association of Mathematics, Science, and Technology Education, Cape Town, South Africa, January 14, 2004.
- 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

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

## Selected Major Presentations and Addresses (1998 – 2008)

- (2008, October). Teachers and teacher education: The National Mathematics Advisory Panel report. National Mathematics Panel Forum, Washington D.C., October 6, 2008.
- (2008, June). (w/ H. Bass). Proving the impossible. Distinguished Lecturer Series, presented at San Diego State University, San Diego, CA, June 6, 2008.
- (2008, June). (w/ H. Bass). Improving U.S. mathematics education: History, myths, and strategies. Distinguished Lecturer Series, presented at San Diego State University, College of Sciences, San Diego, CA, June 5, 2008.
- (2008, May). Opening and closing presentation made at the Mathematical Sciences Research Institute, Critical Issues in Education Workshop: Teaching and Learning Algebra, Berkeley, CA, May 14-16, 2008.
- (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, April 5, 2008.
- (2008, April). (w/ H. Bass). Proving the impossible. Presentation made at the National Council of Teachers of Mathematics Annual Meeting, Salt Lake City, UT, April 11, 2008.
- (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 Pre-session, Salt Lake City, UT, April 9, 2008.
- (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 Pre-session, Salt Lake City, UT, April 8, 2008.
- (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, April 8, 2008.
- (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 Pre-session, Salt Lake City, UT, April 8, 2008.
- (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, March 24, 2008.
- (2008, February). The work of teaching and the challenge for teacher education. The 2008 Charles W. Hunt Lecture, presented at the annual meeting of the American Association of Colleges of Teacher Education, New Orleans, LA, February 9, 2008.
- (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, January 25, 2008.
- (2007, November). Improving mathematics learning: Where are we and where do we need to head? Carnegie/IAS Commission on Mathematics and Science Education, New York, November 8, 2007.
- (2007, September). (w/ H. Hill). Measuring teacher quality in practice. Measurement Challenges and the Assessment of Teacher Quality, Educational Testing Service 2007 Conference, San Francisco, CA, September 24, 2007.
- (2007, September). What makes education research "educational"? Invited colloquium, Learning Policy Center, University of Pittsburgh, Pittsburgh, PA, September 19, 2007.
- (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, April 10, 2007.

- (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, April 10, 2007.
- (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, March 23, 2007.
- (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, March 23, 2007.
- (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 pre session of the annual meeting of the National Council of Teachers of Mathematics, Atlanta, GA, March 20, 2007.
- (2007, March). Teaching mathematics as an unnatural activity. Presentation made at the annual meeting of the National Council of Supervisors of Mathematics, Atlanta, GA, March 20, 2007.
- (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 pre session of the annual meeting of the National Council of Teachers of Mathematics, Atlanta, GA, March 20, 2007.
- (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 made at the Network Connections Conference, Pittsburgh, PA, February 22, 2007.
- (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, January 27, 2007.
- (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, January 26, 2007.
- (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, January 26, 2007.
- (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) pre-session of the annual meeting of the Association of Mathematics Teacher Educators (AMTE), Irvine, CA, January 25, 2007.
- (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) pre-session of the annual meeting of the Association of Mathematics Teacher Educators (AMTE), Irvine, CA, January 24, 2007.

- (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, November 3, 2006.
- (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, American Federation of Teachers, Washington, DC, May 31, 2006.
- (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, May 26, 2006.
- (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, April 25, 2006.
- (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, April 23, 2006.
- (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, April 19, 2006.
- (2006, April). The role of mathematics in learning to participate in a diverse democracy. Invited Kieval lecture, Humboldt State University, Arcata, CA, April 26, 2006.
- (2006, March). Who knows math well enough to teach third grade -- and how can we decide? Presentation to the Wolverine Caucus, Lansing, MI, March 15, 2006.
- (2006, March). (w/H. Bass). Mapping the domain of mathematical knowledge for teaching: Knowing and using mathematics as a teacher. Keynote address, Excellence in Teaching Science and Mathematics Symposium, Loyola University Chicago.
- (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, D.C., January 31, 2005.
- (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, December 20, 2005.
- (2005, October). Knowing mathematics for teaching. Invited address to the NCATE General Assembly, Washington, D.C. October 23, 2005.
- (2005, August). (w/ H. Bass). Teaching for mathematics learning. Invited lecture at conference, The Future of Mathematics Learning, Ströbl, Austria.
- (2005, April). (w/ H. Hill). Knowing mathematics as a teacher. Invited major presentation

- made at the annual meeting of the National Council of Teachers of Mathematics, Anaheim, CA, April 8, 2005.
- (2005, April). Learning the mathematical work of teaching. Invited major presentation made at the annual meeting of the National Council of Supervisors of Mathematics, Anaheim, CA, April 4, 2005.
- (2005, April). Who knows mathematics well enough to teach it? Invited major presentation made at the annual meeting of the Association of State Supervisors of Mathematics, Anaheim, CA, April 4, 2005.
- (2005, March). Who knows mathematics well enough to teach third grade? First Annual Richard Andrews Lecture, University of Missouri, College of Education, Columbia, MO, March 9, 2005.
- (2005, March). (w/ H. Hill). Studying instructional improvement. Invited colloquium, RAND Corporation, Santa Monica, CA, March 4, 2005.
- (2005, February). The role of mathematics in learning to participate in a diverse democracy. Invited lecture in Distinguished Thinkers' lecture series, University of California, Davis, CA, February 28, 2005.
- (2005, February). (w/ H. Bass). Knowing mathematics for teaching. Invited colloquium, Department of Mathematics, Cornell University, Ithaca, NY, February 24, 2005.
- (2005, February). (w/ H. Bass, H. Hill, and S. Schilling). Developing measures of mathematical knowledge for teaching. Teachers Development Group Leadership Seminar, Mathematics Professional Development, Portland, OR, February 18, 2005.
- (2005, February). (w/ H. Bass and K. Suzuka). The professional development of professional developers: Supporting the learning of mathematics teacher educators. Teachers Development Group Leadership Seminar, Mathematics Professional Development, Portland, OR, February 17, 2005.
- (2005, February). (w/ H. Bass). Learning mathematics for teaching: Re-designing "content courses" for teachers. Teachers Development Group Leadership Seminar, Mathematics Professional Development, Portland, OR, February 16, 2005.
- (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, Association of Mathematics Teacher Educators, Dallas, TX, January 27, 2005.
- (2005, January). Using mathematical knowledge for teaching: Putting equity into the equation. Invited keynote address, MET Summit II, Follow-Up Conference, Atlanta, GA, January 4, 2005.
- (2004, November). Knowing what we "know" in-forming policy and practice: The case of mathematics. Invited address, Connecting Research, Practice and Policy in Mathematics and Science Education, The Johnson Foundation's Wingspread Conference Center, Racine, WI, November 8, 2004.
- (2004, May). (w/ H. Bass). Disciplinary knowledge and teaching: Knowing what matters. Invited university-wide lecture, University of Witwatersrand, Johannesburg, South Africa, May 11, 2004.

- (2004, May). Studying instructional improvement. Colloquium at School of Education, University of Witwatersrand, Johannesburg, South Africa, May 10, 2004.
- (2004, April). What are teachers learning? Invited plenary address to the National Council of Supervisors of Mathematics, Philadelphia, PA, April 19, 2004.
- (2004, March). The university and the good life: Lessons learned in third grade. University Honors Convocation Address, University of Michigan, March 14, 2004.
- (2004, February). Making mathematics reasonable. Invited plenary address to Mathematics in Action conference, Grand Valley State University, Grand Rapids, MI, February 26, 2004.
- (2004, February). (w/ H. Bass, M. Hoover, L. Sleep). Knowing mathematics for teaching: Seeing teaching as mathematical work. Invited talk, California State University-Northridge, February 24, 2004.
- (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, January 14, 2004.
- (2003, December). (w/ H. Bass). Giving definition to the teaching and learning of mathematics. Invited keynote address, Canadian Mathematical Society, Vancouver, Canada, December 5, 2003.
- (2003, October). Uncovering the mathematics while covering the curriculum. Invited plenary address to the Primary Mathematics Teachers' Association of Ireland, Dublin, October 14, 2003.
- (2003, June). What mathematics is needed for teaching? Invited presentation for conference, "Why Content Matters: Breaking the Link Between Poverty and Achievement." Washington, DC; June 2, 2003.
- (2003, May). (w/ H. Bass). Learning mathematics for teaching. Invited plenary address, Canadian Mathematics Society Forum on Education, Montréal, Université de Québec; May 17, 2003.
- (2003, May). Using content knowledge in teaching: What do teachers have to do, and therefore have to learn? Invited keynote speaker for Virtual Conference on Sustainability for Local Systemic Change, NSF Local Systemic Initiatives, TERC, May 7–22, 2003.
- (2003, May). (w/H. Bass). Knowing mathematics for teaching. Invited plenary address, international conference on preparing mathematics teachers, "Preparation of Mathematics Teachers for the Future Education and Competence Development," Malmö, Sweden, May 5, 2003.
- (2003, May). Preparing teachers for the mathematical work of teaching. Invited plenary address, annual meeting of the Michigan Chapter of the Mathematical Association of American (MAA), Saginaw Valley, MI; May 2, 2003.
- (2003, April). Learning mathematics for teaching. Invited plenary address to the National Council of Supervisors of Mathematics, San Antonio, TX, April 9, 2003.

- (2003, February). (w/ H. Bass). Roles for mathematicians in mathematics education research and development. Invited plenary address, 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. Tucson, AZ: University of Arizona; February 21, 2003.
- (2003, February). What mathematical knowledge is needed for teaching? Invited presentation, Secretary's Summit on Mathematics, U.S. Department of Education, February 6, 2003; Washington, D.C.
- (2002, October). What do we believe about teacher learning and how can we learn with and from our beliefs? Invited plenary address, annual conference of the Psychology of Mathematics Education, Athens, GA, October 26, 2002.
- (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, September 21, 2002.
- (2002, August). What does it take to (teach to) reason in the primary grades? Invited paper for the International Congress of Mathematicians, Beijing, China; August, 22, 2002.
- (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. April 20, 2002.
- (2001, November). Studying practice to learn in and from experience. Invited keynote address. Invited keynote address to the California Mathematics Council annual meeting, Asilomar, November 30, 2001.
- (2001, November). (w/ H. Bass). Knowing mathematics for teaching: The mathematical problems that teachers have to solve. Invited plenary address, National Summit on the Mathematical Education of Teachers, Washington, D. C., November 2, 2001.
- (2001, July). (w/ D. K. Cohen). Policy for effective classroom practice. Invited plenary session, Council of Chief State School Officers, Wilmington, North Carolina, July 29, 2001.
- (2001, January). (w/ H. Bass). Using mathematics in teaching: What do teachers and mathematicians need to learn? Invited presentation. Mathematical Association of American, Joint Winter Meetings 2001, New Orleans, LA, January 10, 2000.
- (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, Asilomar, December 1, 2000.

- (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, November 9, 2000.
- (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, July 6, 2000.
- (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, June 9, 2000.
- (2000, February). Developing useful and usable mathematical knowledge in and for teaching. Invited keynote address to the Association of Mathematics Teacher Educators, Charlotte, North Carolina, February 11, 2000.
- (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, January 28, 2000.
- (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, January 21, 2000.
- (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, November 29, 1999.
- (1999, November). Challenges of improving instruction: A view from the classroom. Invited major presentation, Council of Basic Education. Wingspread, WI, November 3, 1999.
- (1999, June). Preparing teachers for knowing and learning in practice. Invited keynote address to the MOFET International Conference on Teacher Education, Beit Berl, Israel; June 29, 1999.
- (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, April 22, 1999.
- (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 (March 8, 1999) and the National Academy of Sciences, Teacher Content Preparation Conference, Washington, D. C.; March 20, 1999).
- (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 D.C.: March 4, 1999.
- (1998, September). Research on professional development? What works? Invited address to the AFT/NEA Conference on Teacher Quality, Washington, DC, September 26, 1998.

(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, Cattell Award, American Educational Research Association, San Diego, CA, April 14, 1998.

(1998, February). Connecting policy, teaching, and student performance. Distinguished Lecture at the American Association of School Administrators annual meeting, San Diego, February 28, 1998.

## GRANTS AND FELLOWSHIPS

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.)

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 – 2008)

- 2006 - Member, Spencer Foundation Board of Directors.
- 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 Jaworski.
- 2002 - 2006 Chair, (w/ R. Even). Teacher Education Study, International Commission on Mathematics Instruction.
- 2001 - 2003 Strategic Education Research Program, Instruction Panel. National Research Council.
- 2000 - 2001 University of Michigan, Commission on the Undergraduate Experience.
- 1999 - 2003 RAND project: Improving the Quality of Educational Research and Development. Chair, Mathematics Study Panel.
- 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.
- 1998 - 2003 Videocases in Professional Development Project, Nanette Seago and Judith Mumme, Principal Investigators. Member of advisory staff.

#### AWARDS AND HONORS

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

Elected to membership in the National Academy of Education (NAEd), 2007.

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, March 2000.

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

Teacher-Scholar Award, 1994, Michigan State University.

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, 1988, College of Education, Michigan State University.

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