

## Julie Sarama

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### EDUCATION

Ph.D., Mathematics Education, University at Buffalo, State University of New York, 1995.

Dissertation: *Redesigning Logo: The Turtle Metaphor in Mathematics Education*

M.Ed., Mathematics Education, University at Buffalo, State University of New York, 1989

B.A., Mathematics, University at Buffalo, State University of New York, 1987

### EXPERIENCE

#### University

Kennedy Endowed Chair in Innovative Learning Technologies and  
Professor, University of Denver, 2012-present

Professor, Mathematics Education, University at Buffalo, State University  
of New York, 2010-2012

Associate Professor, Mathematics Education, University at Buffalo, State  
University of New York, 2003-2010

Assistant Professor, Mathematics Education, University at Buffalo, State  
University of New York, 2000-2003

Assistant Professor, Mathematics Education, Wayne State University,  
1996-2000

Instructor, State University College of New York at Buffalo, 1995 - 1996

Research Co-director, University at Buffalo, State University of New York,  
1995-1996

Responsibilities: Initiate and direct research projects within a National Science Foundation  
funded research project, conduct teacher workshops, develop and author grant proposals.

Instructor, University at Buffalo, State University of New York, 1994 - 1996  
Secondary Math Methods and Computers in Elementary Math Education

Research Assistant, University at Buffalo, State University of New York, 1991-1995

Teaching Assistant and Instructor, University at Buffalo, State University of New York, 1988-1989.

Algebra, Trigonometry, and Pre-calculus

## Secondary

Math Teacher, Gifted Math Program, University at Buffalo, State University of New York, 1990-1992

Teaching Assistant, Gifted Math Program, University at Buffalo, State University of New York, 1988-1990

Computer Science and Math Teacher, Frontier Central High School, 1989-1990]

## PROFESSIONAL CONTRIBUTIONS

### Grants and Sponsored Programs

#### *Presently Funded Projects*

1. Clements, D. H., Sarama, J., and Baroody, A., J. Background Research for the NGA Center Project on Early Mathematics. Awarded by the National Governors Association. 7/22/2103-11/30/2103. (4 months; \$25,000).
2. Barrett, Jeffrey, Clements, D. H., and Sarama, J. *Learning Trajectories to Support the Growth of Measurement Knowledge: Pre-K through Middle School*. Awarded by the National Science Foundation, Elementary, Secondary, and Informal Science Education, Research on Educational Policy and Practice, NSF #DRL-1222944. June 1, 2013-May 31, 2016. (48 months; \$3,324,000; DU's portion \$1,228,297).
3. Clements, D. H., Sarama, J. Tatsuoka, C. *Using Rule Space and Poset-based Adaptive Testing Methodologies to Identify Ability Patterns in Early Mathematics and Create a Comprehensive Mathematics Ability Test*. Awarded by the National Science Foundation (48 months; \$2,488,438, with, with an effective date of 09/01/10.).
4. Sarama, J., Clements, D. H., Duke, N. & Brenneman, K. *Early Childhood Education in the Context of Mathematics, Science, and Literacy*. Awarded by the National Science Foundation (48 months; \$ 2,864,231, with an effective date of 09/01/10.), Grant No. DRL-1020118.

5. Clements, D. H., Sarama, J., and Layzer, C. *Scaling Up TRIAD: Longitudinal Study of a Successful Scaling Up Project: Extending TRIAD*. Awarded by the U.S. Department of Education, IES (Institute of Education Sciences, Grant No. R305A110188 (36 months; \$ 1,873,700, with an effective date of 5/1/2011)
6. Barrett, Jeffrey, Clements, D. H., and Sarama, J. *A Longitudinal Account of Children's Knowledge of Measurement*. Awarded by the National Science Foundation, Elementary, Secondary, and Informal Science Education, Research on Educational Policy and Practice. 8/15/2007-9/30/2011. (48 months; \$2,786,504; UB's portion \$604,049, \$114,601 for year 1).
7. Sarama, J., Clements, D. H., Bodrova, E., and Layzer, C. *Increasing the efficacy of an early mathematics curriculum with scaffolding designed to promote self-regulation*. Awarded by the U.S. Department of Education, IES (Institute of Educational Sciences) (48 months; \$3,048,697, with an effective date of 6/1/2008), Grant No. R305A080200. Ends 5/31/2012).
8. Sarama, J. *Comprehensive Postdoctoral Training in Scientific Education Research*. Awarded by the U.S. Department of Education, IES (Institute of Educational Sciences) (48 months; \$726,936, with an effective date of 3/1/2007), Grant No. R305A070468A. Ends 2/28/2011.
9. GSE Video Analysis Collaborative. *Transforming SimpleCommenter into a Power Video Analysis Tool for Research and Teaching*. Awarded by the ETC, University of Buffalo, SUNY (\$10,000, 7/1/2006).
10. Clements, D. H., Sarama, J., & Lee, J. *Scaling Up TRIAD: Teaching Early Mathematics for Understanding with Trajectories and Technologies*. Awarded by the U.S. Department of Education, IES (Institute of Education Sciences; as part of the Interagency Educational Research Initiative, or IERI program, a combination of IES, NSF, and NIH) (60 months; \$6,000,000, with an effective date of 6/1/2005).
11. Clements, D. H. and Sarama, J. *Scaling Up TRIAD: Teaching Early Mathematics for Understanding with Trajectories and Technologies—Supplement*. Awarded by the U.S. Department of Education, IES (Institute of Education Sciences, Grant No. R305K050157; as part of the Interagency Educational Research Initiative, or IERI program, a combination of IES, NSF, and NIH) (60 months; \$1,192,389, with an effective date of 6/1/2005).

### ***Funded Projects Completed***

12. Sarama, J., and Clements, D. H. *Scaling Up TRIAD: Teaching Early Mathematics for Understanding with Trajectories and Technologies—Supplement*. Awarded by the U.S. Department of Education, IES (Institute of Education Sciences; as part of the Interagency Educational Research

- Initiative, or IERI program, a combination of IES, NSF, and NIH) (60 months; \$1,192,389, with an effective date of 6/1/2005).
13. Sarama, J. *Planning for Professional Development in Pre-School Mathematics: Meeting the Challenge of Standards 2000*. Awarded by the National Science Foundation, Teacher Enhancement Program, grant number ESI-9814218. 6/1/98-5/1/99 (full grant 12 months; \$50,000 with an effective date of 10/01/98.).
  14. Sarama, J. [*External Evaluation of*] *Creating a National Library of Interactive Web-Based Virtual Manipulatives for K-8 Mathematics*. Awarded by the National Science Foundation, Instructional Materials Development, forthcoming (evaluation budget 36 months; \$66,458).
  15. Clements, D. H., Sarama, J., Klein, A., & Starkey, Prentice. *Scaling Up the Implementation of a Pre-Kindergarten Mathematics Curricula: Teaching for Understanding with Trajectories and Technologies*. Awarded by the National Science Foundation (NSF, as part of the Interagency Educational Research Initiative, or IERI program, a combination of NSF, Dept. of Education, and NIH) (24 months; \$999,672, with an effective date of 9/15/02).
  16. Sarama, J. & Clements, D. H. [Research portion of materials development grant, in conjunction with Paul Goldenberg and others at EDC]. *Learning by doing: A comprehensive K–5 mathematics curriculum for children and for their teachers*. Awarded by the National Science Foundation, Instructional Materials Development (Sarama is PI at UB. Project is 48 months; \$5,000,000 for the entire effort; \$372,000 for UB’s portion, with an effective date of 06/01/01.).
  17. Clements, D. H. & Sarama, J. *Building Blocks—Foundations for Mathematical Thinking, Pre-Kindergarten to Grade 2: Research-based Materials Development*. Awarded by the National Science Foundation, Instructional Materials Development, grant number ESI-9730804. 6/1/98-5/1/02 (full grant 48 months; \$999,807 with an effective date of 06/01/98; ending date extended to 5/1/2005).
  18. Sarama, J., Clements, D. H., Starkey, Prentice, and Klein, A. *A Longitudinal Study of the Effects of a Pre-Kindergarten Mathematics Curriculum on Low-Income Children’s Mathematical Knowledge*. Awarded by OERI, Department of Education (Sarama is PI at UB. Full grant 48 months; \$2,607,653 [FY 2002, \$688,348] for the entire effort; \$1,065,663 for UB’s portion, with an effective date of 07/15/02.).

**Publications: Articles in Refereed Journals**

1. Clements, D. H., Sarama, J., Wolfe, C. B., & Spitler, M. E. (2013). Longitudinal evaluation of a scale-up model for teaching mathematics with trajectories and technologies: Persistence of effects in the third year. *American Educational Research Journal*, 50(4), 812 - 850. doi: 10.3102/0002831212469270.

2. Szilágyi, J., Clements, D. H., & Sarama, J. (2013). Young children's understandings of length measurement: Evaluating a learning trajectory. *ZDM-The International Journal on Mathematics Education*, 44, 581-620. [www.jstor.org/stable/10.5951/jresematheduc.44.3](http://www.jstor.org/stable/10.5951/jresematheduc.44.3).
3. Sarama, J., Lange, A., Clements, D. H., & Wolfe, C. B. (2012). The impacts of an early mathematics curriculum on emerging literacy and language. *Early Childhood Research Quarterly*, 27, 489-502. doi: 10.1016/j.ecresq.2011.12.002
4. Sarama, J., Clements, D. H., Wolfe, C. B., & Spitler, M. E. (2012). Longitudinal evaluation of a scale-up model for teaching mathematics with trajectories and technologies. *Journal of Research on Educational Effectiveness*, 5(2), 105-135.
5. Weiland, C., Wolfe, C. B., Hurwitz, M. D., Clements, D. H., Sarama, J. H., & Yoshikawa, H. (2012). Early mathematics assessment: Validation of the short form of a prekindergarten and kindergarten mathematics measure. *Educational Psychology*, 32(3), 311-333. doi: 10.1080/01443410.2011.654190
6. Sarama, J., Clements, D. H., Barrett, J. E., Van Dine, D. W., & McDonel, J. S. (2011). Evaluation of a learning trajectory for length in the early years. *ZDM-The International Journal on Mathematics Education*, 43, 667-680. doi: 10.1007/s11858-011-0326-5
7. Clements, D. H., & Sarama, J. (2011). Early childhood mathematics intervention. *Science*, 333, 968-970.
8. Sarama, J., & Clements, D. H. (2011). Mathematics knowledge of low-income entering preschoolers. *Far East Journal of Mathematical Education*, 6(1), 41-63.
9. Clements, D. H., & Sarama, J. (2011). Early childhood teacher education: The case of geometry. *Journal of Mathematics Teacher Education*, 14, 113-148.
10. Clements, D. H., Sarama, J., Spitler, M. E., Lange, A. A., & Wolfe, C. B. (2011). Mathematics learned by young children in an intervention based on learning trajectories: A large-scale cluster randomized trial. *Journal for Research in Mathematics Education*, 42(2), 127-166.
11. Sarama, J., & Clements, D. H. (2009). "Concrete" computer manipulatives in mathematics education. *Child Development Perspectives*, 3(3), 145-150.
12. Sarama, J., & Clements, D. H. (2009). Teaching math in the primary grades: The learning trajectories approach. *Young Children*, 64(2), 63-65.
13. Sarama, J., & Clements, D. H. (2009). Building blocks and cognitive building blocks: Playing to know the world mathematically. *American Journal of Play*, 1, 313-337.
14. Sarama, J., Clements, D. H., Starkey, P., Klein, A., & Wakeley, A. (2008). Scaling up the implementation of a pre-kindergarten mathematics curriculum: Teaching for understanding with trajectories and technologies. *Journal of Research on Educational Effectiveness*, 1(2), 89-119.

15. Klein, A., Starkey, P., Sarama, J., Clements, D. H., & Iyer, R. (2008). Effects of a pre-kindergarten mathematics intervention: A randomized experiment. *Journal of Research on Educational Effectiveness, 1*, 155-178.
16. Clements, D. H., Sarama, J., & Liu, X. (2008). Development of a measure of early mathematics achievement using the Rasch model: The Research-based Early Maths Assessment. *Educational Psychology, 28*(4), 457-482
17. Clements, D. H., & Sarama, J. (2008). Experimental evaluation of the effects of a research-based preschool mathematics curriculum. *American Educational Research Journal, 45*, 443-494.
18. Sarama, J., & Clements, D. H. (2008). Focal points—Grades 1 and 2. *Teaching Children Mathematics, 14*, 396-401.
19. Clements, D. H., & Sarama, J. (2008). Focal points—Pre-K to Kindergarten. *Teaching Children Mathematics, 14*, 361-365.
20. Brown, C. S., Sarama, J., & Clements, D. H. (2007). Thinking about learning trajectories in preschool. *Teaching Children Mathematics, 14*, 178-181.
21. Clements, D. H., & Sarama, J. (2007). Effects of a preschool mathematics curriculum: Summative research on the *Building Blocks* project. *Journal for Research in Mathematics Education, 38*, 136-163.
22. Sarama, J., & Clements, D. H. (2006). Mathematics, young students, and computers: Software, teaching strategies and professional development. *The Mathematics Educator, 9*(2), 16-38.
23. Clements, D. H., & Sarama, J. (2005). Young children's abstract mathematical thinking. *Hong Kong Journal of Early Education, 4*(1), 5-10.
24. Gerber, S., Scott, L., Clements, D. H., & Sarama, J. (2005). Instructor influence on reasoned argument in discussion boards. *Educational Technology Research and Development, 53*(2), 25-39.
25. Clements, D. H., & Sarama, J. (2005). Math play: How young children approach math. *Early Childhood Today, 19*(4), 50-57.
26. Clements, D. H., & Sarama, J. (2004). *Building Blocks* for early childhood mathematics. *Early Childhood Research Quarterly, 19*, 181-189.
27. Clements, D. H., & Sarama, J. (2004). Learning trajectories in mathematics education. *Mathematical Thinking and Learning, 6*, 81-89.
28. Clements, D. H., Wilson, D. C., & Sarama, J. (2004). Young children's composition of geometric figures: A learning trajectory. *Mathematical Thinking and Learning, 6*, 163-184.
29. Clements, D. H., & Sarama, J. (2004). Mathematics everywhere, every time. *Teaching Children Mathematics, 10*, 421-426.
30. Sarama, J., Clements, D. H., Swaminathan, S., & McMillen, S., & González Gómez, R. M., (2003). Development of mathematical

- concepts of two-dimensional space in grid environments: An exploratory study. *Cognition and Instruction*, 21, 285-324.
31. Clements, D. H., & Sarama, J. (2003). Strip mining for gold: Research and policy in educational technology—A response to “Fool’s Gold”. *Educational Technology Review*, 11(1). Retrieved from <http://www.aace.org/pubs/etr/issue4/clements.cfm>.
  32. Sarama, J., & Clements, D. H. (2003). *Building Blocks* of early childhood mathematics. *Teaching Children Mathematics*, 9, 480-484.
  33. Clements, D., & Sarama, J. (2002). Teaching with computers in early childhood education: Strategies and professional development. *Journal of Early Childhood Teacher Education*, 23, 215-226.
  34. Clements, D. H., & Sarama, J. (2002). Mathematics curricula in early childhood. *Teaching Children Mathematics*, 9, 163-166.
  35. Sarama, J. (2002). Listening to teachers: Planning for professional development. *Teaching Children Mathematics*, 9, 36-39.
  36. Sarama, J., & Clements, D. H. (2002). Design of microworlds in mathematics and science education. *Journal of Educational Computing Research*, 27(1&2), 1-6.
  37. Sarama, J., & Clements, D. H. (2002). *Building Blocks* for young children’s mathematical development. *Journal of Educational Computing Research*, 27(1&2), 93-110.
  38. Clements, D. H., Sarama, J., & DiBiase, A.-M. (2002). Preschool and kindergarten mathematics: A national conference. *Teaching Children Mathematics*, 8, 510-514.
  39. Clements, D. H., & Sarama, J. (2002). The role of technology in early childhood learning. *Teaching Children Mathematics*, 8, 340-343.
  40. Sarama, J. (2000). Toward more powerful computer environments: Developing mathematics software on research-based principles. *Focus on Learning Problems in Mathematics*, 22(3&4), 125-147.
  41. Clements, D. H., & Sarama, J. (2000). The earliest geometry. *Teaching Children Mathematics*, 7(2), 82-86.
  42. Clements, D. H., & Sarama, J. (2000). *Standards for preschoolers*. *Teaching Children Mathematics*, 7(1), 38-41.
  43. Clements, D. H., & Sarama, J. (2000). Young children’s ideas about geometric shapes. *Teaching Children Mathematics*, 6, 482-488.
  44. Sarama, J., & Clements, D. H. (2000). Predicting pattern blocks on and off the computer. *Teaching Children Mathematics*, 6, 458-462.
  45. Clements, D. H., Swaminathan, S., Hannibal, M. A. Z., & Sarama, J. (1999). Young children’s concepts of shape. *Journal for Research in Mathematics Education*, 30, 192-212.

46. Sarama, J., Clements, D., & Henry, J. J. (1998). Network of influences in an implementation of a mathematics curriculum innovation. *International Journal of Computers for Mathematical Learning*, 3, 113-148.
47. Clements, D. H., Sarama, J., & Battista, M. T. (1998). Development of concepts of geometric figures in a specially-designed Logo computer environment. *Focus on Learning Problems in Mathematics*, 20, 47-64.
48. Sarama, J., & Clements, D. (1998). Using computers for algebraic thinking. *Teaching Children Mathematics*, 5, 186-190.
49. Clements, D. H., Battista, M. T., Sarama, J., & Swaminathan, S. (1997). Development of students' spatial thinking in a unit on geometric motions and area. *The Elementary School Journal*, 98(2), 171-186.
50. Clements, D. H., & Sarama, J. (1997). Research on Logo: A decade of progress. *Computers in the Schools*, 14(1-2), 9-46.
51. Clements, D. H., Battista, M. T., Sarama, J., Swaminathan, S., & McMillen, S. (1997). Students' development of length measurement concepts in a Logo-based unit on geometric paths. *Journal for Research in Mathematics Education*, 28, 70-95.
52. Clements, D. H., & Sarama, J. (1997). Computers support algebraic thinking. *Teaching Children Mathematics*, 3(6), 320-325.
53. Clements, D. H., Battista, M. T., Sarama, J., & Swaminathan, S. (1996). Development of turn and turn measurement concepts in a computer-based instructional unit. *Educational Studies in Mathematics*, 30, 313-337.
54. Clements, D. H., & Sarama, J. (1996). Turtle Math: Redesigning Logo for elementary mathematics. *Learning and Leading with Technology*, 23(7), 10-15.
55. Clements, D. H., & Sarama, J. (1995). Design of a Logo environment for elementary geometry. *Journal of Mathematical Behavior*, 14, 381-398.
56. Clements, Douglas H., & Meredith, Julie Sarama (1993). My turn: A talk with the Logo turtle. *Arithmetic Teacher*, 41, 189-191.
57. Clements, Douglas H., & Meredith, Julie Sarama (1993). Research on Logo: Effects and efficacy. *Journal of Computing in Childhood Education*, 4, 263-290.

**Publications: Books and Monographs**

1. Sarama, J., & Clements, D. H. (2009). *Early childhood mathematics education research: Learning trajectories for young children*. New York: Routledge.
2. Clements, D. H., & Sarama, J. (2009). *Learning and teaching early math: The learning trajectories approach*. New York: Routledge.
3. Clements, D. H., J. Sarama, DiBiase, A-M. (2004). *Engaging young children in mathematics: Standards for early childhood mathematics education*. Mahwah, NJ, Lawrence Erlbaum Associates.



4. Clements, D. H., Battista, M. T., & Sarama, J. (2001). Logo and geometry. *Journal for Research in Mathematics Education Monograph Series*, 10.

#### **Publications: Editorships**

1. Clements, D. H., & Sarama, J. (Eds.). (2004). Learning trajectories in mathematics education [Special issue]. *Mathematical Thinking and Learning*, 6(2).
2. Senior editor on a special issue, Design of microworlds in mathematics and science education, in *Journal of Educational Computing Research*, 2002, 27(1&2).
3. Editing the Early Childhood Corner Department of *Teaching Children Mathematics* for two years, Sept. 2000-2003.

#### **Publications: Chapters**

1. Sarama, Julie, & Clements, Douglas H. (2013). Lessons learned in the implementation of the TRIAD scale-up model: Teaching early mathematics with trajectories and technologies. In T. G. Halle, A. J. Metz & I. Martinez-Beck (Eds.), *Applying implementation science in early childhood programs and systems* (pp. 173-191). Baltimore, MD: Brookes.
2. Clements, Douglas H., & Sarama, Julie. (2013). Rethinking early mathematics: What is research-based curriculum for young children? In L. D. English & J. T. Mulligan (Eds.), *Reconceptualizing early mathematics learning* (pp. 121-147). Dordrecht, Germany: Springer
3. Clements, Douglas H., & Sarama, Julie. (2013). Solving problems: Mathematics for young children. In D. R. Reutzel (Ed.), *Handbook of research-based practice in early education* (pp. 348-363). New York, NY: The Guilford Press.
4. Sarama, J., & Clements, D. H. (2012). Mathematics for the whole child. In S. Suggate & E. Reese (Eds.), *Contemporary debates in childhood education and development* (pp. 71-80). New York, NY: Routledge.
5. Clements, D. H., & Sarama, J. (2012). Learning and teaching early and elementary mathematics. In J. S. Carlson & J. R. Levine (Eds.), *Instructional strategies for improving student learning: Focus on early mathematics and reading* (Vol. 3 of Psychological perspectives on contemporary educational issues, pp. 107-162). Charlotte, NC: Information Age Publishing.
6. Sarama, J., & Clements, D. H. (2012). Walking the same *broad* path (with side trips): Response to comments. In J. S. Carlson & J. R. Levine (Eds.), *Instructional strategies for improving student learning: Focus on early mathematics and reading* (Vol. 3 of Psychological perspectives on contemporary educational issues, pp. 205-212). Charlotte, NC: Information Age Publishing.
7. Clements, D. H., & Sarama, J. (2012). Mathematics learning, assessment, and curriculum. In R. C. Pianta, L. Justice, S. W. Barnett & S. Sheridan (Eds.), *Handbook of Early Education* (pp. 217-239). New York, NY: Guilford.

8. Clements, D. H., & Sarama, J. (2011). Standards, curriculum, and learning trajectories in mathematics education. In Susan Pettit-Riley (Eds.), *Research in mathematics education: Where do we go from here?* (pp. 7-29). Institute for Research on Mathematics and Science Education, Michigan State University, East Lansing, MI
9. Sarama, J., Clements, D. H., Parmar, R. S., & Garrison, R. (2011). Geometry. In F. Fennell (Ed.), *Achieving fluency: Special education and mathematics* (pp. 163-196). Reston, VA: National Council of Teachers of Mathematics.
10. Parmar, R. S., Garrison, R., Clements, D. H., & Sarama, J. (2011). Measurement. In F. Fennell (Ed.), *Achieving fluency: Special education and mathematics* (pp. 197-218). Reston, VA: National Council of Teachers of Mathematics.
11. Sarama, J., & Clements, D. H. (2010). The mathematical lives of young children. In V. Washington & J. Andrews (Eds.), *Children of 2020: Creating a better tomorrow* (pp. 81-84). Washington, DC: Council for Professional Recognition/National Association for the Education of Young Children
12. Clements, D. H., & Sarama, J. (2010). Technology. In V. Washington & J. Andrews (Eds.), *Children of 2020: Creating a better tomorrow* (pp. 119-123). Washington, DC: Council for Professional Recognition/National Association for the Education of Young Children.
13. Sarama, J., & Clements, D. H. (2010). Preschool mathematics curricula. In B. J. Reys, R. E. Reys & R. Rubenstein (Eds.), *Mathematics curriculum: Issues, trends, and future directions* (pp. 115-126). Reston, VA: National Council of Teachers of Mathematics.
14. Clements, D. H., & Sarama, J. (2009). Learning trajectories in early mathematics – Sequences of acquisition and teaching. In R. S. New & M. Cochran (Eds.), *Encyclopedia of language and literacy development* (pp. 1-6). London, ON: Canadian Language and Literacy Research Network.
15. Sarama, J., & Clements, D. H. (2008). Linking research and software development. In G. W. Blume & M. K. Heid (Eds.), *Research on technology and the teaching and learning of mathematics: Volume 2, cases and perspectives* (pp. 113-130). New York: Information Age Publishing, Inc.
16. Clements, D. H., Sarama, J., Yelland, N. J., & Glass, B. (2008). Learning and teaching geometry with computers in the elementary and middle school. In M. K. Heid & G. W. Blume (Eds.), *Research on technology and the teaching and learning of mathematics: Volume 1, research syntheses* (pp. 109-154). New York: Information Age Publishing, Inc.
17. Sarama, J., & Clements, D. H. (2008). Mathematics in early childhood. In O. N. Saracho & B. Spodek (Eds.), *Contemporary perspectives on mathematics in early childhood education* (pp. 67-94). Charlotte, NC: Information Age Publishing, Inc.

18. Clements, D. H., & Sarama, J. (2008). Mathematics and technology: Supporting learning for students and teachers. In O. N. Saracho & B. Spodek (Eds.), *Contemporary perspectives on science and technology in early childhood education* (pp. 127-147). Charlotte, NC: Information Age Publishing, Inc.
19. Clements, D. H., & Sarama, J. (2007). Early childhood mathematics learning. In F. K. Lester, Jr. (Ed.), *Second handbook of research on mathematics teaching and learning* (pp. 461-555). New York: Information Age Publishing.
20. Clements, D. H., & Sarama, J. (2007). Einsatz von Computern in amerikanischen Vor- und Grundschulen — Ein Zwischenbericht [Using computers in American kindergartens and primary schools: An interim report]. In H. Mitzlaff (Ed.), *Internationales Handbuch: Computer (ICT), Grundschule, Kindergarten und Neue Lernkultur* (Vol. 1, pp. 251-259). Schneider Verlag Hohengehren: Baltmannsweiler.
21. Clements, D. H., & Sarama, J. (2007). Zur Rolle des Computers in der frühen Mathematik in amerikanischen Kindergärten und Grundschulen—Das Projekt "Building Blocks for Early Childhood Mathematics" [The role of computers in American kindergartens and primary schools: The Building Blocks for Early Childhood Mathematics project]. In H. Mitzlaff (Ed.), *Internationales Handbuch: Computer (ICT), Grundschule, Kindergarten und Neue Lernkultur* (Vol. 2, pp. 538-546). Schneider Verlag Hohengehren: Baltmannsweiler.
22. Clements, D. H., & Sarama, J. (2007). Gold der Narren?—"Fools' Gold"?—Kritische Bemerkungen zur Kritik der Alliance for Childhood et al. [Fool's Gold? Critical Remarks about the critics from the Alliance for Childhood]. In H. Mitzlaff (Ed.), *Internationales Handbuch: Computer (ICT), Grundschule, Kindergarten und Neue Lernkultur* (Vol. 2, pp. 740-748). Schneider Verlag Hohengehren: Baltmannsweiler.
23. Clements, D. H., & Sarama, J. (2007). Mathematics. In R. S. New & M. Cochran (Eds.), *Early Childhood Education: An international encyclopedia* (Vol. 2, pp. 502-509). Westport, CN: Praeger.
24. Clements, D. H., & Sarama, J. (2007). Curriculum, technology. In R. S. New & M. Cochran (Eds.), *Early Childhood Education: An international encyclopedia* (Vol. 1, pp. 221-225). Westport, CN: Praeger.
25. Clements, D. H., Sarama, J., & McDonald, S.-K. (2007). Interagency Education Research Initiative (IERI) In R. S. New & M. Cochran (Eds.), *Early Childhood Education: An international encyclopedia* (Vol. 2, pp. 455). Westport, CN: Praeger.
26. Clements, D. H., & Sarama, J. (2007). Curriculum, mathematics. In R. S. New & M. Cochran (Eds.), *Early Childhood Education: An international encyclopedia* (Vol. 1, pp. 193-198). Westport, CN: Praeger.

27. Sarama, J., & Clements, D. H. (2006). Mathematics in kindergarten. In D. F. Gullo (Ed.), *K today* (pp. 85-94). Washington, DC: National Association for the Education of Young Children.
28. Clements, D. H., & Sarama, J. (2005). Young children and technology: What's appropriate? In W. Masalski & P. C. Elliott (Eds.), *Technology-supported mathematics learning environments: 67th yearbook* (pp. 51-73). Reston, VA: National Council of Teachers of Mathematics.
29. Sarama, J., & Clements, D. H. (2006). Mathematics in kindergarten. In D. F. Gullo (Ed.), *K today* (pp. 85-94). Washington, DC: National Association for the Education of Young Children.
30. Clements, D. H., & Sarama, J. (2005). Young children and technology: What's appropriate? In W. Masalski & P. C. Elliott (Eds.), *Technology-supported mathematics learning environments: 67th yearbook* (pp. 51-73). Reston, VA: National Council of Teachers of Mathematics.
31. Sarama, J. (2004). Technology in early childhood mathematics: *Building Blocks™* as an innovative technology-based curriculum. In D. H. Clements, J. Sarama & A.-M. DiBiase (Eds.), *Engaging young children in mathematics: Standards for early childhood mathematics education* (pp. 361-375). Mahwah, NJ: Lawrence Erlbaum Associates.
32. Sarama, J., & DiBiase, A.-M. (2004). The professional development challenge in preschool mathematics. In D. H. Clements, J. Sarama & A.-M. DiBiase (Eds.), *Engaging young children in mathematics: Standards for early childhood mathematics education* (pp. 415-446). Mahwah, NJ: Lawrence Erlbaum Associates.
33. Clements, D. H., & Sarama, J. (2004). Shape steps. In J. V. Copley (Ed.), *Showcasing mathematics for the young child* (pp. 79-81). Reston, VA: National Council of Teachers of Mathematics.
34. Sarama, J., & Clements, D. H. (2002). Learning and teaching with computers in early childhood education. In O. N. Saracho & B. Spodek (Eds.), *Contemporary Perspectives in Early Childhood Education* (pp. 171-219). Greenwich, CT: Information Age Publishing, Inc.
35. Sarama, J. (2001). New development and research on Logo and geometry. In E. Yackel (Ed.), *Logo and Geometry: Journal for Research in Mathematics Education Monograph Number 10* (pp. 111-125). Reston, VA: National Council of Teachers of Mathematics.
36. Clements, D. H., Battista, M. T., & Sarama, J. (1998). Students' development of geometric and measurement ideas. In R. Lehrer & D. Chazan (Eds.), *Designing learning environments for developing understanding of geometry and space* (pp. 201-225). Hillsdale, NJ: Lawrence Erlbaum Associates.
37. Clements, D. H., & Sarama, J. (1997). Research on Logo: A decade of progress. In C. D. Maddux & D. L. Johnson (Eds.), *Logo: A retrospective* (pp. 9-46). Haworth Press.

38. Clements, D. H., & Sarama, J. (1997). Children's mathematical reasoning with the turtle metaphor. In L. D. English (Ed.), *Mathematical reasoning: Analogies, metaphors, and images* (pp. 313-337). Mahway, NJ: Lawrence Erlbaum Associates.
39. Clements, D. H., Sarama, J., & Swaminathan, S. (1997). Young children's concepts of shape. In E. Pehkonen (Ed.), *Proceedings of the 21st Conference of the International Group for the Psychology of Mathematics Education* (pp. 161-168). Lahti, Finland: University of Helsinki.
40. Clements, D. H., Sarama, J., & Battista, M. T. (1996). Development of turn and turn measurement concepts in a computer-based instructional unit. In E. Jakubowski, D. Watkins, & H. Biske (Ed.), *Proceedings of the Eighteenth Annual Meeting of the North America Chapter of the International Group for the Psychology of Mathematics Education* (pp. 547-552). Columbus, OH: ERIC Clearinghouse for Science, Mathematics, and Environmental Education.
41. Clements, D. H., Sarama, J., Battista, M. T., & Swaminathan, S. (1996). Development of students' spatial thinking in a curriculum unit on geometric motions and area. In E. Jakubowski, D. Watkins, & H. Biske (Ed.), *Proceedings of the Eighteenth Annual Meeting of the North America Chapter of the International Group for the Psychology of Mathematics Education* (pp. 217-222). Columbus, OH: ERIC Clearinghouse for Science, Mathematics, and Environmental Education.
42. Sarama, J., Clements, D. H., Henry, J. J., & Swaminathan, S. (1996). Multidisciplinary research perspectives on an implementation of a computer-based mathematics innovation. In E. Jakubowski, D. Watkins, & H. Biske (Ed.), *Proceedings of the Eighteenth Annual Meeting of the North America Chapter of the International Group for the Psychology of Mathematics Education* (pp. 560-565). Columbus, OH: ERIC Clearinghouse for Science, Mathematics, and Environmental Education.
43. Sarama, J., Clements, D. H., & Vukelic, E. B. (1996). The role of a computer manipulative in fostering specific psychological / mathematical processes. In E. Jakubowski, D. Watkins, & H. Biske (Ed.), *Proceedings of the Eighteenth Annual Meeting of the North America Chapter of the International Group for the Psychology of Mathematics Education* (pp. 567-572). Columbus, OH: ERIC Clearinghouse for Science, Mathematics, and Environmental Education.
44. Yelland, N. J., Clements, D. H., Masters, J. E. Sarama, J. (1996). Children, computers, and mathematical ideas: Evaluating a research-based version of Logo. In J. Oakley (Ed.), *Logo in Australia* (pp. 309-328). Richmond, Victoria, Australia: Computing in Education Group of Victoria.
45. Clements, Douglas H., Meredith, Julie Sarama, & Yelland, Nicola. (1994). Investigations in geometry with Geo-Logo. In M. Ryan (Ed.),

Proceedings of the Asia Pacific Information Technology in Training and Education Conference (pp. 79-83). Brisbane, Australia: APITITE 94 Council.

### **Publications: Articles in Nonrefereed Journals**

1. Clements, D. H., & Sarama, J. (2009). The importance of the early years. *Better: Evidence-based Education*, 2(1), 6-7.
2. Sarama, J., & Clements, D. H. (2007). How children problem solve. *Early Childhood Today*, 21(7), 16-19.
3. Sarama, J., and Clements, D. H. (2006, November/December). Books that build math skills. *Early Childhood Today*, 21, 20
4. Sarama, J., & Clements, D. H. (2006, September). Math and literacy: A powerful pair. *Early Childhood Today*, 21, 17
5. Clements, D. H., & Sarama, J. (2006, September). The number-letter connection. *Parent & Child*, 22
6. Sarama, J., & Clements, D. H. (2006). Mathematics in kindergarten. *Young Children*, 61(5), 38-41.
7. Sarama, J. & Clements, D. H. (2006). Introducing geometry to young children. *Early Childhood Today*, 20(7), 12-13.
8. Sarama, J., & Clements, D. H. (2006, February / March). 5 math myths. *Parent & Child*, 44-45.
9. Sarama, J., & Clements, D. H. (2006, February / March). Easy as 1, 2, 3! *Parent & Child*, 22
10. Sarama, J., & Clements, D. H. (2005). How children "Think math". *Early Childhood Today*, 20(2), 11.
11. Clements, D. H., & Sarama, J. (2005, October). How children "Think math". *Parent & Child*, 25.
12. Clements, D. H., & Sarama, J. (2005). Math play. *Parent & Child*, 12(4), 36-45.
13. Clements, D. H., & Sarama, J. (2004). Building abstract thinking through math. *Early Childhood Today*, 18(5), 34-41.
14. Sarama, J., & Clements, D. H. (2004). Thinking big! How math builds abstract-thinking skills. *Parent & Child*, 11(5), 36-46.
15. Clements, D. H., & Sarama, J. (2003). Creative pathways to math. *Early Childhood Today*, 17(4), 36-45. [invited]
16. Clements, D. H., & Sarama, J. (2003, February / March). Creative pathways to math: Nurturing your child's mathematical mind. *Parent & Child*, 34-40.

17. Clements, D. H., Sarama, J., & DiBiase, A-M. (2002, February / March). A learning continuum in geometry. *Intersection*. Pp. 1-3.

*Note: The following Logo Exchange article is one of over 30 similar articles from a monthly column that spanned the years 1992 to 2000 in which Sarama & Clements exchanged senior authorship.*

18. Clements, D. H., & Sarama, J. (1999). Logo and high-level geometric thinking. *Logo Exchange*, 18 (1), pp. 23-24.

### **Publications: Assessments**

1. Clements, D. H., Sarama, J., & Wolfe, C. B. (2011). *TEAM—Tools for early assessment in mathematics*. Columbus, OH: McGraw-Hill Education.

### **Publications: Curriculum Materials and Textbooks**

1. Clements, D. H., & Sarama, J. (2013). *Building Blocks, Volumes 1 and 2*. Columbus, OH: McGraw-Hill (2 volumes, Teacher's Edition, Teacher's Resource Guide, Assessment Guide).
2. Clements, D. H., & Sarama, J. (2007). *SRA Real Math, PreK—Building Blocks*. Columbus, OH: SRA / McGraw-Hill
3. Griffin, S., Clements, D. H., & Sarama, J. (2007). *Number Worlds/Building Blocks: A prevention/intervention program: Teacher edition level B*. Columbus, OH: SRA / McGraw-Hill.
4. Schiller, P., Clements, D. H., Sarama, J., & Lara-Alecio, R. (2003). *DLM Early Childhood Express*. Columbus, OH: SRA / McGraw-Hill. (324 pages for each of four publications, A to D)
5. Clements, D. H., & Sarama, J. (2003). *DLM Early Childhood Express Math Resource Guide*. Columbus, OH: SRA / McGraw-Hill. (Descriptions of the DLM Math program, suggestions for teaching, activity sheets, etc.)
6. Economopoulos, Karen, Murray, Megan, O'Neil, Kim, Clements, Douglas H., Sarama, Julie, and Russell, Susan Jo. (1998). *Making shapes and building blocks*. Menlo Park, CA: Dale Seymour Publications. (192 pages)
7. Schiller, P., Clements, D. H., Sarama, J., & Lara-Alecio, R. (2003). *DLM Early Childhood Express. Teacher's Edition A*. Columbus, OH: SRA / McGraw-Hill. (324 pages)
8. Schiller, P., Clements, D. H., Sarama, J., & Lara-Alecio, R. (2003). *DLM Early Childhood Express. Teacher's Edition B*. Columbus, OH: SRA / McGraw-Hill. (324 pages)
9. Schiller, P., Clements, D. H., Sarama, J., & Lara-Alecio, R. (2003). *DLM Early Childhood Express. Teacher's Edition C*. Columbus, OH: SRA / McGraw-Hill. (324 pages)

10. Schiller, P., Clements, D. H., Sarama, J., & Lara-Alecio, R. (2003). *DLM Early Childhood Express. Teacher's Edition D*. Columbus, OH: SRA/McGraw-Hill. (324 pages)
11. Snider, A., Burk, D., Clements, D. H., & Sarama, J. (2000). *Technology Connections, Kindergarten*. Salem, OR: The Math Learning Center.
12. Snider, A., Burk, D., Clements, D. H., & Sarama, J. (2000). *Technology Connections, First Grade*. Salem, OR: The Math Learning Center.
13. Russell, S. J., Clements, D. H., & Sarama, J. (1998). *Quilt squares and block towns*. Menlo Park, CA: Dale Seymour Publications. (238 pages)
14. Economopoulos, Karen, Joan Akers, Douglas H. Clements, Anne Goodrow, Jerrie Moffet, and Julie Sarama. (1997). *Mathematical thinking at grade 2*. Palo Alto, CA: Dale Seymour Publications. (218 pages)
15. Akers, J., Battista, M. T., Goodrow, A., Clements, D. H., & Sarama, J. (1997). *Shapes, halves, and symmetry: Geometry and fractions*. Palo Alto, CA: Dale Seymour Publications (209 pages).
16. Goodrow, A., Clements, D. H., Battista, M. T., Sarama, J., & Akers, J. (1997). *How long? How far? Measurement*. Palo Alto, CA: Dale Seymour Publications. (167 pages).
17. Tierney, C., Nemirovsky, R., Noble, T., Clements, D. H., & Sarama, J. (1996). *Patterns of change*. Cambridge, MA: Dale Seymour Publications (152 pages).
18. Economopoulos, K., Akers, J., Clements, D. H., Goodrow, A., Moffet, J., & Sarama, J. (1996). *Mathematical thinking at grade 2.* Cambridge, MA: Dale Seymour Publications (218 pages).
19. Clements, D. H., Tierney, C., Murray, M., Akers, J., & Sarama, J. (1996). *Picturing polygons*. Cambridge, MA: Dale Seymour Publications (206 pages).
20. Clements, Douglas H., Battista, Michael T., Akers, Joan, Woolley, Virginia, Meredith, Julie Sarama & McMillen, Sue (1995). *Turtle paths*. Cambridge, MA: Dale Seymour Publications.
21. Clements, Douglas H., Russell, Susan Jo, Tierney, Cornelia, Battista, Michael T., & Meredith, Julie Sarama (1995). *Flips, turns, and area*. Cambridge, MA: Dale Seymour Publications.

### **Computer Software**

1. Clements, D. H., & Sarama, J. (2003). *DLM Math Software* [software]. Columbus, OH: SRA/McGraw-Hill. (Eleven different research-based software programs, with up to 7 leveled activities in each, all managed by a complete computer-managed instruction system, each designed and researched by the authors; includes teacher's manual)
2. Clements, D. H., & Sarama, J. (2001). *Pattern Blocks and Mini-Quilts*. Salem, OR: The Math Learning Center.



3. Clements, D. H., & Sarama, J. (2001). *Quilts & Pattern Block Puzzles*. Salem, OR: The Math Learning Center.
4. Clements, D. H., & Sarama, J. (1998). *Shapes—Making shapes* [Computer program]. Palo Alto, CA: Dale Seymour Publications.
5. Clements, D. H., & Sarama, J. (1998). *Shapes—Quilt squares/block town* [Computer program]. Palo Alto, CA: Dale Seymour Publications.
6. Clements, D. H., Sarama, J. (1996). *Geo-Logo How Long? How Far?*[Computer program]. Palo Alto, CA: Dale Seymour Publications.
7. Clements, D. H., & Sarama, J. (1997). *Shapes—Shapes, halves, symmetry* [Computer program]. Palo Alto, CA: Dale Seymour Publications.
8. Clements, D. H., & Sarama, J. (1997). *Shapes—Mathematical thinking* [Computer program]. Palo Alto, CA: Dale Seymour Publications.
9. Clements, D. H., Sarama, J. (1996). *Trips* [Computer program]. Palo Alto, CA: Dale Seymour Publications.
10. Clements, D. H., Sarama, J. (1996). *Geo-Logo Picturing Polygons* [Computer program]. Palo Alto, CA: Dale Seymour Publications.
11. Clements, Douglas H. & Meredith, Julie Sarama (1995). *Geo-Logo Turtle Paths* [Computer program]. Palo Alto, CA: Dale Seymour Publications.
12. Clements, Douglas H. & Meredith, Julie Sarama (1995). *Geo-Logo Ships & Grids* [Computer program]. Palo Alto, CA: Dale Seymour Publications.
13. Clements, Douglas H. & Meredith, Julie Sarama (1995). *Tumbling Tetrominoes* [Computer program]. Palo Alto, CA: Dale Seymour Publications.
14. Clements, Douglas H. & Meredith, Julie Sarama (1995). *Turtle math* [Computer program]. Montreal, Quebec: LCSI.

**Publications: Other**

1. Clements, D. H., & Sarama, J., & Baroody, A. J. (2013). *Background Research on Early Mathematics*. Washington, DC: National Governors Association.
2. Clements, D. H., & Sarama, J., Baroody, A. J., Mincic, M., & Cruz, B. (2013). *State Early Childhood and Pre-K-3 Policies and Best Practices for Early Mathematics*. Washington, DC: National Governors Association.
3. Clements, D. H., & Sarama, J. (2013). *Math in the early years* [ECS Research Brief: The progress of educational reform]. Denver CO: Education Commission of the States.

Clements, D. H., & Sarama, J. (2004). [Review of] *FUNDamentally MATH: 1 + 1 through Algebra*. *Teaching Children Mathematics*, 10, 429-430.

2. Sarama, J. (2001). [Review of] *MindTwister Math, Gr. 3 and 4*. *Teaching Children Mathematics*, 7(8), 486.

2. Sarama, J. (2001). [Review of] Math Mysteries Measurement Grades 4-7. *Teaching Children Mathematics*, 7(8), 486; 488.
3. Sarama, J. (2000). [Review of] The baby-sitters club series: 4th grade learning adventures. *Teaching Children Mathematics*, 7(2), 116.
4. Sarama, Julie (1995). [Review of] Geometry Inventor. *Teaching Children Mathematics*, 1(6) 394-395.
5. Clements, Douglas H. & Meredith, Julie Sarama (1993). Design of a research-based logo environment for elementary geometry. In N. Estes & M. Thomas (Ed.), *Rethinking the roles of technology in education* (pp. 679-681). Cambridge, MA: Massachusetts Institute of Technology.
6. Clements, Douglas H. & Meredith, Julie Sarama (1992). *Research on Logo: Effects and efficacy*. New York: Logo Foundation.

### **Presentations/Conferences: International**

1. SRCD Biennial Meeting, Seattle, WA, April 17-21 2013. Three presentations: *Sustainability of Fidelity to a Prekindergarten Mathematics Curriculum and Professional Development Scale-Up Intervention*; *A Pre-K Mathematics Curriculum: Impacts on Early Literacy*; and *Effects of Preschool Mathematics Interventions on Achievement in Mathematics, Literacy, and Language and on Social-Emotional Development*.
2. SRCD Biennial Meeting, Montreal, Quebec, Canada, March 31-April 2, 2011. Five presentations: *Scaling Up Successful Interventions in Diverse Environments: Longitudinal Analyses of an Early Math*; *A Factorial Invariance Analysis of the Early Mathematics Assessment With Prekindergarteners*; *Longitudinal Impacts On Rapid Automated Naming: Results From a Large CRT on a PreKindergarten Mathematics Curriculum*; *Measurement of Fidelity of Implementation to a Core Technology Component and Effects on Outcomes in a Pre-K Mathematics*; *Psychometrics and Validation of the Short Form of an Early Mathematics Assessment*.
3. The 11<sup>th</sup> International Congress on Mathematical Education (ICME), Monterrey, Mexico, July 7-13, 2008. Led Topical Study Group 1 and presented a paper, *Scaling up Early Mathematics: The TRIAD Project*.
4. The 21st Conference of the International Group for the Psychology of Mathematics Education. The Netherlands, Summer, 2001. *Composition of geometric figures*. With D. Clements and D. Wilson.
5. The 21st Conference of the International Group for the Psychology of Mathematics Education. Lahti, Finland: University of Helsinki, July, 1997. *Young children's concepts of shape*. With D. Clements and S. Swaminathan.

6. The Annual Meeting of the International Conference of Technology in Education. Orlando, FL, March, 1995. *Effecting Change: Inhibitors and Facilitators of a Computer-based Curriculum Innovation*. With D. Clements.
7. The Annual Meeting of the International Conference of Technology in Education. Orlando, FL, March, 1995. *Turtle Math: Liberating Learners of Mathematics*. With D. Clements.
8. Asia Pacific Information Technology in Training and Education Conference and Exhibition, 1994, Brisbane, Australia. *Investigations in geometry with Geo-Logo*.
9. International Council for Technology in Education, March, 1993. Two presentations: *Design of a research-based logo environment for elementary geometry* (with Douglas H. Clements)
10. International Group for the Psychology of Mathematics Education, Sixteenth Annual Conference, Durham, New Hampshire, August 1992. *Design of a logo environment for elementary geometry*.

#### **Presentations/Conferences: National**

1. Planned, Managed, Conducted, Wrote Background Briefs, and Keynoted at the NGA Early Math Expert Roundtable, Washington, DC, November 21, 2013.
2. NAEYC Annual Conference & Expo, Washington, DC, November 21, 2013. Two presentations: *Report of the NRC Committee on Early Mathematics and Science, Math, Literacy, and Social-emotional Development in Early Childhood— Can We Do It All?*
3. Keynote, 9th Annual NALEO National Summit on the State of Latino Education, Washington, DC, Oct. 1, 2013. *Planting the Seed: STEM in Early Learning*. (invited)
4. SREE — Society for Research on Educational Effectiveness Annual Conference, Washington, DC, Sept. 27-28, 2013. Two presentations: *Longitudinal Evaluation of a Scale-Up Model for Teaching Mathematics with Trajectories and Technologies: Persistence of Effects Three Years after the Treatment* and *Approaches to Incorporating Late Pretests in Experiments: Evaluation of Two Early Mathematics and Self-Regulation Interventions*. (refereed)
5. Scaling Educational Innovations, National Science Foundation, Arlington, Virginia, July 11, 2013. *Evaluation of a Scale-up Model: Effects and Diffusion*.

6. Keynote, 2013 National Forum on Education Policy, Education Commission of the States, St. Louis, MO. June 25, 2013 - June 27, 2013. *The surprising importance of early mathematics.*
7. Mathematical Instruction for Perseverance, Spencer Foundation and the National Science Foundation, Chicago, Illinois, June 23, 2013 - June 24, 2013. *Evaluation of a Scale-up Model for Children of Poverty: Persistence of Effects and Effects on Perseverance.*
8. Transitions, Continuity and Alignment: Preschool to Third Grade, Administration for Children and Families, Washington, D.C., June 18, 2013 - June 19, 2013. *Evaluation of a Scale-up Model for Children of Poverty: Transitions to Primary School.*
9. Jean Piaget Society Conference, American Educational Research Association, Chicago, IL, June 6, 2013 - June 8, 2013. *Framing and Revising a Hypothetical Learning Trajectory for Volume Measurement.*
10. Annual Meeting of the American Educational Research Association, San Francisco, CA, April 28-May 1, 2013. Three papers: *Scale Up at the Level of Multiple School Districts: Lessons Learned From Multiple IERI- and IES-Funded Projects; Framing and Revising a Hypothetical Learning Trajectory for Volume Measurement: Integrating Longitudinal Case Studies and the Rasch Model; and Evaluation of a Scale-up Model for Children of Poverty: Longitudinal Study of Persistence of Effects.*
11. Annual Meeting of the National Council of Teachers of Mathematics, Denver, CO, April 17-20, 2013. Two presentations: *Math Lessons from Research and Computers in Early Childhood: Getting the Best of All Worlds.*
12. Research Presession, National Council of Teachers of Mathematics, Denver, CO, April 15-17, 2013. Two papers: *Creating cognitively diagnostic adaptive assessments using learning trajectories; Framing and Revising a Hypothetical Learning Trajectory for Area Measurement; .*
13. Keynote, Association of the State Supervisors of Mathematics 2013 Annual Meeting, Denver, CO, Apr 13, 2013. *The Building Blocks of Mathematics.* (invited)
14. National Center for Early Child Education (NCRECE) Quality Improvement Meeting, Washington, DC, Mar 19, 2013. *Early mathematics: Standards, Assessment, and Curriculum.* (invited)
15. Aligning and Implementing Birth-3rd Grade Learning Standards: A Strong Foundation for College and Career Readiness, Co-sponsored by the NGA Center for Best Practices and the Council of Chief State School Officers Philadelphia, PA, Mar 15, 2013. *The surprising importance of early mathematics.* (invited)

16. SREE — Society for Research on Educational Effectiveness Annual Conference, Washington, DC, Mar 9, 2013. *Sustainability of Fidelity of Implementation Over Time, in the Context of a Prekindergarten Mathematics Curriculum and Professional Development Scale-Up Intervention*. (refereed)
17. IES Principal Investigators' Annual Meeting, Washington, DC, Mar 5-6, 2013. *Longitudinal effects of a research-based model of scale-up*. (refereed)
18. NSF DR K-12 PI Meeting, , Washington, DC, June 13-15, 2012. Three papers. *Using Rule Space and Poset-based Adaptive Testing Methodologies to Identify Ability Patterns in Early Mathematics and Create a Comprehensive Mathematics Ability Test; Learning Progressions and Trajectories in Research: Methodological and Theoretical Challenges; Meeting the Challenges and Reaping the Benefits of Longitudinal Research Studies in Math and Science for DR K-12 Projects; and one poster, Connect 4 Learning: An interdisciplinary preschool curriculum*. (refereed)
19. Annual Meeting of the National Council of Teachers of Mathematics, Philadelphia, PA, April 25-27, 2012. *Research in early mathematics*.
20. Research Presession, National Council of Teachers of Mathematics, Philadelphia, PA, April 22-24, 2012. Three presentations: *Teachers' Learning of Learning Trajectories, Measurement Club: Filling a Developmental Gap, and Effects of Building Blocks games on young children's learning*.
21. Annual Meeting of the American Educational Research Association, Vancouver, BC, Canada, April 15-18. Three papers: *From Rasch Models to Rule Space and Poset-Based Adaptive Testing, Connect4Learning: Early Childhood Education in the Context of Mathematics, Science, Literacy, and The U.S. Building Blocks and TRIAD Scale-up Projects*.
22. SREE — Society for Research on Educational Effectiveness Annual Conference, Washington, DC, March 7, 2012. *The Efficacy of an Intervention Synthesizing Scaffolding Designed to Promote Self Regulation with an Early Mathematics Curriculum: Effects on Executive Function*. (refereed)
23. Invited speech, U.S. Department of Education, Washington, DC, March 13, 2012. *Critical Early Mathematics from Cognitive Science to Scale*.
24. Keynote presentation, National Science Board's meeting of the Committee on Education and Human Resources (CEH), Washington, DC, Dec 13, 2011. *Educational research: From basic to applied and beyond*.
25. NAEYC Annual Conference & Expo, Orlando, FL, November 1-2, 2011. *Connect4Learning: Early Childhood Education in the Context of Mathematics, Science, and Literacy*.

26. PME-NA, Psychology in Mathematics Education. Two presentations: *Learning Trajectories: Foundations for Effective, Research-based Education*. Washington, DC, October 19-23, 2011. (invited)
27. SREE — Society for Research on Educational Effectiveness, First Annual Math & Science Conference. Four presentations: (1) *Early Childhood Education Symposium: Development, Implementation, and Evaluation of Preschool Mathematics and Science Intervention Models*; (2) *Pathways from R&D to Marketplace Dissemination*; (3) *Early Mathematics Education For All: Evaluation of an Intervention Using Multiple Methodologies* and (4) *Outcomes, and Assessment in Early Childhood Mathematics and Science*. Washington, DC, September 7-9, 2011. (two invited, two refereed)
28. SREE — Society for Research on Educational Effectiveness Second Annual Conference, *Early Childhood Education Symposium: The Effects of Pre-Kindergarten and Pre-Kindergarten Curricula on Emergent Math and Literacy Skills*, and a poster, *Evaluation of the TRIAD Scale-up Model: Longitudinal evaluation*. Washington, DC, March 4, 2011. (refereed)
29. Institute of Education Sciences Research Conference, Washington, DC, June 28-30, 2010. Presentations: *Scaling Up TRIAD: Teaching Early Mathematics for Understanding with Trajectories*, and *Efficacy of Computerized Earobics and Building Blocks Instruction for Kindergarteners from Low SES, Minority Backgrounds: Year 2 Results*.
30. Head Start's Tenth National Research Conference, Washington, DC, June 21-22, 2010. Two presentations: *Report of the NRC Committee on Early Childhood Mathematics: Evidence of Effective Policies and Practices for Math Education*, and *Children's Understanding of Mathematics and Science Concepts in the Preschool Years*.
31. The Annual Meeting of the American Educational Research Association, Denver, CO, May 1-4, 2010. Five presentations: *Hypothetical Learning Trajectory for Length in the Early Years*; *Life After RCTs: Addressing the Issue of Palatability of Instructional Interventions: The TRIAD / Building Blocks Scale-Up Project: Effectiveness and Diffusion*; *Evaluation of a Developmental Progression for Length Measurement Using the Rasch Model*; *Scaling Up Successful Interventions in Diverse Environments: Longitudinal Analyses of an Early Math Intervention*; *Effects of an Early Math Curriculum on Early Literacy and Language: Impacts, Mediators, and Moderators*.
32. Research Pre-session, National Council of Teachers of Mathematics, San Diego, CA, April 18-19, 2010. Three presentations: *Defining and Implementing Learning Trajectories as Research Tools*; *Math Learning in Early Childhood: Paths Toward Excellence and Equity — NRC*; *Tools of the Trade*.

33. Annual Meeting of the National Council of Teachers of Mathematics, San Diego, CA, April 19-23, 2010. *The National Research Council Report on Early Mathematics—Implications for Teaching.*
34. Invited Plenary Symposium, 2010 Meeting of the Society for Research on Educational Effectiveness, Washington, DC, March 4-5, 2010. *Evaluation of an Intervention based on the Curriculum Research Framework: Scale Up.*
35. Keynote presentation, 2010 Meeting of the Society for Research on Educational Effectiveness, Washington, DC, March 4-5, 2010. *Interaction of Research, Practice, and Policy in Mathematics Education.*
36. NAEYC's National Institute for Early Childhood Professional Development, Charlotte, NC, June 14-16, 2009. Playing with Math—Research on the Relationships between Play and the Learning and Teaching of Mathematics.
37. Annual Meeting of the National Council of Teachers of Mathematics, Washington, D.C., April 23-28, 2009. Presentation: Mixing Assessment and Instruction: Getting Children to Think and Talk about Measurement Meaningfully and Mathematics Specialists.
38. Research Pre-session of 2009 National Council of Teachers of Mathematics, Washington, D.C., April 20-22, 2009. Two presentations: Scaling Up High-Quality Mathematics for All Children and Mathematics Specialists and Report of the NRC Committee on Early Childhood Mathematics.
39. The Annual Meeting of the American Educational Research Association, San Diego, CA, April 12-18. Three papers: Scaling Up Successful Interventions: Multidisciplinary Perspectives; Hypothetical Learning Trajectory for Length: A Multidisciplinary Study, and Children's Abstraction of Iterative Units to Measure Linear Space: A Learning Trajectory for Teaching Length.
40. The 2009 Annual Meeting of the National Association for Research in Science Teaching, Garden Grove, CA, April 17-21. Hypothetical Learning Trajectory for Measurement: A Multidisciplinary Study.
41. The Biennial Meeting of the Society for Research in Child Development, Denver, CO, April 1-4, 2009. Three papers: Evaluation of a Model for Scaling Up Interventions: Teaching Early Math for Understanding with Trajectories and Technologies; A PreK Mathematics Curriculum: Impacts on Early Literacy; Early Intervention Research and Children's School Readiness: What Role Does Curriculum Play?
42. SREE — Society for Research on Educational Effectiveness Second Annual Conference, Experimental Evaluation of a Scale-up Model for Teaching

- Mathematics with Trajectories and Technologies, Washington, DC, February 2, 2009. (invited)
43. Conference for the Advancements of Mathematics Teaching, CAMT 2008: Steering Mathematics Towards Excellence, Dallas, TX, July 9, 2008. Teaching math: 7 successful strategies. (invited)
  44. Institute of Education Sciences Research Conference, Washington, DC, June 10-12, 2008. Scaling Up TRIAD: Teaching Early Mathematics for Understanding with Trajectories and The impact of an intensive PreK mathematics curriculum on emerging literacy and language skills.
  45. NAEYC's National Institute for Early Childhood Professional Development, New Orleans, LA, June 8-10, 2008. A technology triad: scaling up with computers for teachers, children, and teacher trainers.
  46. Research Pre-session of the 86th Annual Meeting of the National Council of Teachers of Mathematics, Salt Lake City, UT, March, 2007. Two presentations: Scaling Up TRIAD: Teaching Math with Trajectories and Technologies and Mathematics Specialists and Coaches: Research and Issues from the Field.
  47. Two presentations, the 86th Annual Meeting of the National Council of Teachers of Mathematics, Salt Lake City, UT, March, 2007. Making Research-based Innovations Work in Large Urban Settings: Lessons Learned, and Computers in Early Childhood: The Best of All Possible "Worlds"
  48. The Annual Meeting of the American Educational Research Association, New York, March, 2007. Two presentations: Scaling-Up Interventions: The Case of Mathematics, Mentoring and Coaching as Critical Components of Teacher Growth in Implementing and Preschool Mathematics Curriculum.
  49. Institute of Education Sciences Research Conference, Washington, DC, June 6-8, 2007. Scaling Up TRIAD: Early Descriptive Data and Innovative Software for Professional Development and Experimental Evaluation of a Research-based PreK Math Curriculum.
  50. The Annual Meeting of the American Educational Research Association, Chicago, IL, April, 2007. Development of a Measure of Early Mathematics Achievement Using the Rasch Model (with Xiufeng Liu and Douglas H. Clements).
  51. The Annual Meeting of the American Educational Research Association, Chicago, IL, April, 2007. NCTM's "Curriculum Focal Points".



52. The Annual Meeting of the American Educational Research Association, Chicago, IL, April, 2007. How Should Preschoolers Spend Their Day? Integration and Conflicts Across Developmental Areas: Objectives and Educational Importance.
53. The Biennial Meeting of the Society for Research in Child Development, Boston, MA, March 2007. Symposium/paper: Concreteness and Cognitive Development: New Perspectives on a Classic Developmental Issue.
54. The Biennial Meeting of the Society for Research in Child Development, Boston, MA, March 2007. Development of a Measure of Early Mathematics Developmental Progressions Using the Rasch Model.
55. The Biennial Meeting of the Society for Research in Child Development, Boston, MA, March 2007. Fostering Development Among Teachers and Children in Literacy, Math, Science and Social Development.
56. The Biennial Meeting of the Society for Research in Child Development, Boston, MA, March 2007. Effects of Early Childhood Interventions on Children's School Readiness: Findings From an Evaluation Study of Preschool Curricula.
57. Research Pre-session of the 85th Annual Meeting of the National Council of Teachers of Mathematics, Atlanta, GA, March, 2007. Research and the Curriculum Focal Points.
58. The 85th Annual Meeting of the National Council of Teachers of Mathematics, Atlanta, GA, March, 2007. Representing math ideas: Learning trajectories for young children and their teachers.
59. The 85th Annual Meeting of the National Council of Teachers of Mathematics, Atlanta, GA, March, 2007. Powerful representations of mathematics for early childhood.
60. The 85th Annual Meeting of the National Council of Teachers of Mathematics, Atlanta, GA, March, 2007. Curriculum Focal Points and Curricula in Early Childhood..
61. The Annual Meeting of the National Association for the Education of Young Children (NAEYC), Atlanta, GA, Nov. 8-11, 2006. The Building Blocks mathematics project: Evaluating a research-based preschool mathematics curriculum in low- and mixed-income communities.
62. Institute of Education Sciences Research Conference, Washington, DC, June 14-16, 2006. Scaling Up the Implementation of a Pre-Kindergarten Mathematics Curriculum: Teaching for Understanding with Trajectories and Technologies and Scaling Up TRIAD: Teaching Early Mathematics for Understanding with Trajectories and Technologies.

63. Research Presession of the 84th Annual Meeting of the National Council of Teachers of Mathematics, St. Louis, April, 2006. Randomized Trials in Mathematics Education Research (organizer and presenter).
64. The 84<sup>th</sup> Annual Meeting of the National Council of Teachers of Mathematics, St. Louis, April, 2006. Research-based technology: Software for early and primary education.
65. The 84<sup>th</sup> Annual Meeting of the National Council of Teachers of Mathematics, St. Louis, April, 2006. Prekindergarten math for disadvantaged children: Research on Building Blocks.
66. The Annual Meeting of the American Educational Research Association, San Francisco, CA, April, 2006. Rethinking Concrete Manipulatives and Concrete Ideas.
67. Research Presession of the 84th Annual Meeting of the National Council of Teachers of Mathematics, St. Louis, April, 2006. Randomized Trials in Mathematics Education Research (organizer and presenter).
68. The 84<sup>th</sup> Annual Meeting of the National Council of Teachers of Mathematics, St. Louis, April, 2006. Research-based technology: Software for early and primary education.
69. The 84<sup>th</sup> Annual Meeting of the National Council of Teachers of Mathematics, St. Louis, April, 2006. Prekindergarten math for disadvantaged children: Research on Building Blocks.
70. The Annual Meeting of the American Educational Research Association, San Francisco, CA, April, 2006. Preschool Curriculum Evaluation Research.
71. The Annual Meeting of the American Educational Research Association, San Francisco, CA, April, 2006. Experimental Evaluation of the Effects of Research-Based Preschool Mathematics Curricula.
72. The Annual Meeting of the American Educational Research Association, San Francisco, CA, April, 2006. Randomized Trials in Curriculum Research: The Case of Mathematics.
73. The Annual Meeting of the American Educational Research Association, San Francisco, CA, April, 2006. Scaling Up the Implementation of a Pre-Kindergarten Mathematics Curricula: A Program Evaluation.
74. The Annual Meeting of the National Association for the Education of Young Children, Washington, DC, Dec. 6-10, 2005. Longitudinal study of Pre-K mathematics. Paper, component of the Preschool Curriculum Evaluation Research Project. With the entire national cohort group.

75. National Math Symposium, Edutopia, Skywalker Ranch, CA, October 21 2005. Technology and Mathematics. (invited)
76. The NAEYC's National Institute for Early Childhood Professional Development, Miami Beach, FL, June 5-8, 2005. Closing the gap in early math: Research shows that curriculum matters.
77. The Biennial Meeting of the Society for Research in Child Development, Atlanta, GA, April 2005. Symposium/paper: Curricula As Intervention: Preliminary Results From the Preschool Curriculum Evaluation Research (PCER) Program: National and Site Specific Data.
78. The Biennial Meeting of the Society for Research in Child Development, Atlanta, GA, April 2005. Symposium/paper: Curricula As Intervention: Results From Randomized Control Trials.
79. The Biennial Meeting of the Society for Research in Child Development, Atlanta, GA, April 2005. Electronic Poster: Effects of a Research-Based Preschool Mathematics Curriculum.
80. The Biennial Meeting of the Society for Research in Child Development, Atlanta, GA, April 2005. Poster: A hypothetical learning trajectory in practice: Young children's composition of geometric figures.
81. The Annual Meeting of the American Educational Research Association, Montreal, Canada, April, 2005. Mathematics knowledge of low-income entering preschoolers.
82. The Annual Meeting of the American Educational Research Association, Montreal, Canada, April, 2005. Longitudinal study of a preschool mathematics curriculum. A paper presented as part of a symposium, Preschool Curriculum Evaluation Research (PCER) 2002: Lessons learned from two years of curriculum implementation. Young Children and Creative Technologies.
83. Research Presession of the 83rd Annual Meeting of the National Council of Teachers of Mathematics, Anaheim, CA, April, 2005. Closing the Gap: Interventions in Early Childhood Mathematics Education. With J. Sarama (organizers and presenters).
84. The 83rd Annual Meeting of the National Council of Teachers of Mathematics, Anaheim, CA, April, 2005. PreK Mathematics Across Diverse Settings—Issues of Scaling Up. With J. Sarama.
85. The Annual Meeting of the American Educational Research Association, San Diego, CA, April, 2004. Young children's composition of geometric figures: A learning trajectory. A paper presented as part of a symposium organized by Sarama & Clements, The Use of Learning Trajectories in

- Research-based Mathematics Curriculum Development, Assessment, and Professional Development. With D. Clements.
86. The Annual Meeting of the American Educational Research Association, San Diego, CA, April, 2004. Curriculum Research: Toward a Framework for “Research-based Curricula. With D. Clements.
  87. The Annual Meeting of the American Educational Research Association, New Chicago, IL, April, 2003. Effects of a Research-based Preschool Mathematics Curriculum: Summative Evaluation of the Building Blocks Project. With D. Clements.
  88. The Annual Meeting of the National Association for the Education of Young Children, Chicago, IL, Nov. 5-9, 2003. Preschool Curriculum Evaluation Research Project. With the entire national cohort group.
  89. The Annual Meeting of the National Association for the Education of Young Children, Chicago, IL, Nov. 5-9, 2003. Teaching the Young Thinker: Integrating Learning, Development, and High-Quality Practices in Mathematics. With D Clements, M. E. Bardsley, and J. Copley.
  90. The Annual Meeting of the American Educational Research Association, New Chicago, IL, April, 2003. Effects of a Research-based Preschool Mathematics Curriculum: Summative Evaluation of the Building Blocks Project. With D. Clements.
  91. Research Presession of the 81th Annual Meeting of the National Council of Teachers of Mathematics, San Antonio, April, 2003. Multiple Perspectives on an Early Childhood Mathematics Curriculum Research Project. With D. Clements (organizer and presenters), and M. E. Bardsley, M. E. Spittler
  92. The Annual Meeting of the National Association for the Education of Young Children, New York, NY, November 19-22, 2002. The Building Blocks of early childhood math: Hands-on and computer activities. With D. Clements and M.E. Bardsley.
  93. The Annual Meeting of the American Educational Research Association, New Chicago, IL, April, 2003. Effects of a Research-based Preschool Mathematics Curriculum: Summative Evaluation of the Building Blocks Project. With D. Clements.
  94. DLM Summer Institute, Houston, TX, July 23-25, 2002. The Building Blocks of ECE Mathematics. With D. Clements.
  95. Institute for Early Childhood Mathematics, Rutgers University in New Brunswick, NJ, July 9-11, 2002. The Building Blocks of ECE Mathematics. With D. Clements.

96. Head Start's 6th National Research Conference, Washington, D. C., June 19-22, 2002. Research on early childhood mathematics: Building Blocks.
97. NAEYC's National Institute for Early Childhood Professional Development, Albuquerque, NM., June 9-12, 2002. The Building Blocks of Professional Development in ECE Mathematics. With D. Clements.
98. Research Presession of the 80th Annual Meeting of the National Council of Teachers of Mathematics, Las Vega, NV, April, 2002. *The Use of Learning Trajectories in Curriculum Development and Research*. With D. Clements (organizer and presenters)
99. The 80th Annual Meeting of the National Council of Teachers of Mathematics, Las Vega, NV, April, 2002. Building Blocks: Play, Manipulatives, and Computers for PreK-2 Mathematics. With D. Clements
100. The Annual Meeting of the American Educational Research Association, New Orleans, LA, April, 2002. Geometric composition and decomposition in the early years. With D. Clements and D. Wilson.
101. The Annual Meeting of the American Educational Research Association, New Orleans, LA, April, 2002. Evaluation and comparison of four geometric turn interfaces. With D. Clements.
102. Keynote address: The Annual Meeting of the National Association for the Education of Young Children. November 2, 2001, Anaheim, CA. Teaching What Counts: Math and Computers in Early Childhood Teacher Education. With D. Clements
103. The Annual Meeting of the National Association for the Education of Young Children. November 1-3 (repeated 3 times), Anaheim, CA. *Building Blocks and Math Makers software*. With D. Clements
104. NAEYC's National Institute for Early Childhood Professional Development, Washington, D. C., June 10-13, 2001. *Engaging young children in mathematics: The Conference on Standards for Preschool and Kindergarten Mathematics Education*. With D. Clements and Ann-Marie DiBiase (invited)
105. NAEYC's National Institute for Early Childhood Professional Development, Washington, D. C., June 10-13, 2001. *An Investigation into Professional Development in Early Childhood Mathematics*. With Mary Elaine Spitzer (invited)
106. The Annual Meeting of the American Educational Research Association, Seattle, WA, April, 2001. *Computers in early childhood mathematics*. With D. Clements.

107. Research Presession of the 79th Annual Meeting of the National Council of Teachers of Mathematics, Orlando, FL, April 2-4, 2001. The role of research in technology-intensive curricula and tools - comments from a case study.
108. Research Presession of the 79th Annual Meeting of the National Council of Teachers of Mathematics, Orlando, FL, April 2-4, 2001. *Research-based Standards for PreK-2 Mathematics: Findings from a National Conference*. (Organizer and presenter.) With D. Clements.
109. The 79th Annual Meeting of the National Council of Teachers of Mathematics, Orlando, FL, April, 2001. *Principles and Standards for Prekindergarten through Grade 2 and Building Blocks: Activities that Meet the Goals*.
110. The 79th Annual Meeting of the National Council of Teachers of Mathematics, Orlando, FL, April, 2001. Linking research and the early childhood mathematics standards of Principles and Standards for School Mathematics. With D. Clements & A. DiBiase.
111. The Annual Meeting of the National Association for the Education of Young Children. November 8, 2000, Atlanta, GA. *The New Preschool to Grade 2 Math Standards and Building Blocks—Activities that Meet the Goals*. With D. Clements
112. The Annual Meeting of the National Association for the Education of Young Children. November 8, 2000, Atlanta, GA. *Planning for Professional Development in Pre-School Mathematics: Meeting the Challenge of the New Math Standards for a Diverse Population*.
113. ExxonMobil Annual Conference, Falls Church VA, September, 2000. *Conference on Early Childhood Mathematics Standards*. With Douglas H. Clements and Ann-Marie DiBiase (invited)
114. The Ninth Annual Conference of the National Association for the Education of Young Children's National Institute for Early Childhood Professional Development. June 4-7, 2000, San Francisco, CA. *Professional Development in Early Childhood Mathematics: Meeting the Challenge of Standards 2000*. With Douglas H. Clements and Mary Elaine Spitler (senior presenter; refereed)
115. Conference on Standards for Preschool and Kindergarten Mathematics Education, Arlington, VA. May 2000. Technology in early childhood mathematics: Building Blocks as an innovative technology-based curriculum. (invited)
116. The Annual Meeting of the American Educational Research Association, New Orleans, LA, April, April, 2000. Composition of

- geometric figures by young children. With D. H. Clements and L. Rothenberg.
117. The 78th Annual Meeting of the National Council of Teachers of Mathematics, San Francisco, CA, April, 2000. Linking research and the new early childhood mathematics standards. With D. H. Clements, organizer.
  118. The 78th Annual Meeting of the National Council of Teachers of Mathematics, San Francisco, CA, April, 2000. Early childhood mathematics and technology.
  119. The Annual Meeting of the National Association for the Education of Young Children (NAEYC), Toronto, ON, Canada, Nov., 1998. *NAEYC's position on technology—what does research say?*. With D. Clements.
  120. The Annual Meeting of the American Educational Research Association, San Diego, CA, April, 1998. *Students' development of concepts of two-dimensional space*. With D. Clements.
  121. The Annual Meeting of the American Educational Research Association, San Diego, CA, April, 1998. *Evaluation of an educational environment designed on research-based principles*. With D. Clements.
  122. Research Presession, Annual Meeting of the National Council of Teachers of Mathematics, Washington, DC, March 1998. Constructivist software: developing computer environments based on theoretical models.
  123. The 76th Annual Meeting of the National Council of Teachers of Mathematics. Washington, DC, April, 1998. *Research-based constructivist software environments*. With D. Clements
  124. The 75th Annual Meeting of the National Council of Teachers of Mathematics. Minneapolis, MN, April, 1997. *The use of a computer manipulative in elementary mathematics*. With D. Clements.
  125. The 75th Annual Meeting of the National Council of Teachers of Mathematics. Minneapolis, MN, April, 1997. *Meeting the technological challenge: Transforming early and primary math with computers*. With D. Clements.
  126. The Annual Meeting of the American Educational Research Association, Chicago, IL, March, 1997. *Young children's concepts of shape*. With Douglas H. Clements, M. A. Z. Hannibal, S. Swaminathan, D. Schrier.

127. The Annual Meeting of the American Educational Research Association, Chicago, IL, March, 1997. *The effects of Shapes, a computer manipulative, on children's psychological/mathematical processes*. With Douglas H. Clements and E. B. Vukelic.
128. The Annual Meeting of the American Educational Research Association, Chicago, IL, March, 1997. *Effectiveness of a synthesized curriculum on kindergarten children's geometric thinking*. With S. Swaminathan, D. Schrier.
129. The Eighteenth Annual Meeting of the North America Chapter of the International Group for the Psychology of Mathematics Education (PME-NA), Panama City, FL, October 1996. *Development of students' spatial thinking in a curriculum unit on geometric motions and area*. With D. H. Clements, M. Battista.
130. The Eighteenth Annual Meeting of the North America Chapter of the International Group for the Psychology of Mathematics Education (PME-NA), Panama City, FL, October 1996. *The role of a computer manipulative in fostering specific psychological/mathematical processes*. With D. H. Clements, E. Vukelic.
131. The Eighteenth Annual Meeting of the North America Chapter of the International Group for the Psychology of Mathematics Education (PME-NA), Panama City, FL, October 1996. *Development of turn and turn measurement concepts in a computer-based instructional unit*. With D. H. Clements, M. Battista, S. Swaminathan.
132. The Eighteenth Annual Meeting of the North America Chapter of the International Group for the Psychology of Mathematics Education (PME-NA), Panama City, FL, October 1996. *Multidisciplinary research perspectives on an implementation of a computer-based mathematics innovation*. With D. H. Clements, J. Henry, S. Swaminathan.
133. NCTM Research Presession, Annual Meeting of the National Council of Teachers of Mathematics, San Diego, April 1996. *A year in the life of Turtle Math: Multiple perspectives on an implementation of a mathematics innovation*. With D. H. Clements, J. Henry, S. Swaminathan, E. Vukelic, & L. Steffe
134. The Annual Meeting of the American Educational Research Association, New York City, April 1996. Development of concepts of geometric figures in a specially-designed Logo computer environment. With D. Clements and M. T. Battista
135. The Annual Meeting of the American Educational Research Association, New York City, April 1996. Development of students' spatial



- thinking in a curriculum unit on geometric motions and area. With D. Clements and M. T. Battista
136. National Educational Computing Conference. Baltimore, MD, June 1995. Technology in the "Investigations in Number, Data, and Space" project. With D. Clements.
  137. National Educational Computing Conference. Baltimore, MD, June 1995. Asserting the role of programming in the intellectual and creative development of students. With D. Clements.
  138. National Educational Computing Conference. Baltimore, MD, June 1995. Logosium: Logo research, Past, present future. With D. Clements.
  139. National Educational Computing Conference. Baltimore, MD, June 1995. Workshop: Integrating Software From Investigations in Number, Data and Space Project. With D. Clements.
  140. National Educational Computing Conference. Baltimore, MD, June 1995. Workshop: Turtle Math: A Computer Environment and Activities for Elementary Mathematics. With D. Clements.
  141. The Annual Meeting of the American Educational Research Association, San Francisco, April 1995. Turn concepts in a computer-based instructional unit. With D. Clements and M. T. Battista
  142. The Annual Meeting of the American Educational Research Association, San Francisco, April 1995. Network of Influences in an Implementation of a Mathematics Curriculum Innovation. With D. Clements and J. Henry
  143. The 73rd Annual Meeting of the National Council of Teachers of Mathematics. Boston, MA, April, 1995. Unique contributions of computers to learning and teaching geometry: Multiple perspectives. With D. Clements & M. T. Battista. (refereed; Clements organized, proposed, and presented at this symposium)
  144. The 73rd Annual Meeting of the National Council of Teachers of Mathematics. Boston, MA, April, 1995. Students' development of length concepts in a computer-based Investigations unit With D. Clements & M. T. Battista.
  145. The 73rd Annual Meeting of the National Council of Teachers of Mathematics, CLIME presentation. Boston, MA, April, 1995. Innovative Logo environments. With D. Clements. (invited)
  146. International Group for the Psychology in Mathematics Education—North American Chapter, Baton Rouge, LA, November 5-8,

1994. Students' development of length measurement concepts using a specially-designed turtle graphics environment.
147. International Group for the Psychology in Mathematics Education—North American Chapter, Baton Rouge, LA, November 5-8, 1994. Turtle Math: A Logo environment grounded in research. With D. Clements (Sarama was first author and presenter).
148. International Group for the Psychology in Mathematics Education—North American Chapter, Baton Rouge, LA, November 5-8, 1994. Computers environments for spatial-numerical concepts. With D. Clements & M. Battista.
149. National Educational Computing Conference. Boston, MA, June 1994. Logosium: Logo Research: Thresholds.
150. National Educational Computing Conference. Boston, MA, June 1994. A computer environment for elementary geometry and spatial sense. With D. Clements & M. T. Battista.
151. National Educational Computing Conference. Boston, MA, June 1994. Turtle Math: A version of Logo and activities for elementary mathematics. With D. Clements .
152. The 72nd Annual Meeting of the National Council of Teachers of Mathematics, CLIME presentation. Indianapolis, IN, April 14, 1994. A new software environment for geometry, grades 3-6. (invited)
153. The Annual Meeting of the American Educational Research Association, New Orleans, April 1994. Students' development of length measurement concepts using a specially-designed turtle graphics environment.
154. Geometry Center Software Conference, Minneapolis, MN July 15 - July 18. Design of a Logo Environment for Elementary Geometry. (invited)
155. Geometry Center Software Conference, Minneapolis, MN July 15 - July 18. Students' development of length and turn measurement concepts in a computer-based unit on geometric paths. (invited)
156. The Annual Meeting of the American Educational Research Association, Geometry Working Group, Atlanta, GA, April 1993. Students' construction of length and angle measure. (invited)

### **Presentations/Conferences: State and Regional**

1. Keynote and 2<sup>nd</sup> talk. North Carolina Council of Teachers of Mathematics, Greensboro, North Carolina, November 1, 2013. Keynote: *The Building*

- Blocks of Early Mathematics. Presentation: Teaching Math to Young Children: The Paths of Early Mathematics (invited)*
2. Keynote, Kindergarten Conference, Boston, MA. Sept. 4, 2013. *TRIAD Scale Up and the Building Blocks of Early Mathematics.*
  3. Jennings and Rebecca Jones Foundation, Murfreesboro, TN. June 4-5, 2013. *Critical Thinking with the Common Core: K-2.*
  4. National Council of Teachers of Mathematics, Dallas, TX, October 11-12, 2012. *Math Lessons from Research (invited)*
  5. Colorado Council of Teachers of Mathematics, Denver, CO, October 27-28, 2011. Two presentations: *Math Lessons from Research; The Building Blocks of Early Mathematics (invited)*
  6. Presentation, Center for Cognitive Science, Buffalo, NY, April 23, 2008. *The TRIAD Project.*
  7. Presentation Association of Math Teachers of New Jersey, Newark, NJ, October 26, 2007. *The Building Blocks of Math.*
  8. Presentation, Western New York Regional Mathematics Conference, Clarence, NY, October 20, 2007. *Curriculum Focal Points and Research.*
  9. The Conference for the Advancement of Math Teaching Annual Conference, San Antonio, TX, June 28-30, 2007, Standards, NCTM's Curriculum Focal Points, and the Building Blocks of Math, and Software for Learning Mathematics: The Best of all Possible Worlds.
  10. Presentation, NYS Association for the Education of Young Children, Westchester, NY, May 4, 2007. The Building Blocks of Early Mathematics and The Building Blocks mathematics project: Evaluating a research-based preschool mathematics curriculum in low- and mixed-income communities.
  11. One of two main presenters, SUNY Training Strategies, Math: What's Play Got to Do with It?, a videoconference delivered by satellite to 5,000 child care providers at sites throughout NYS, June 24, 2004, 7 p.m. to 9 p.m.
  12. WNY Regional Mathematics Consortium, South Buffalo, NY, October 14, 2003. Teaching That Counts: Mathematics in the Early Years . With Douglas H. Clements (invited)
  13. Two presentations, DLM Summer Institute. *The DLM Express Math Lessons and Technology in the Early Years*, July 23, 2003. With D. Clements (invited)

14. Early Childhood Leadership Institute, Washington, DC, June 27-28, 2003. *The Building Blocks of Early Childhood Math*. With D. Clements, M. E. Bardsley, and R. O'Dell
15. Keynote speakers, Creating & Maintaining High Quality Preschools: Implementing the Early Childhood Expectations in Abbott Preschools, Union, NJ, May 30, 2003. *The Building Blocks of Early Childhood Math*. With D. Clements (invited)
16. Connecticut State Dept. of Education Conference on Early Mathematics, Hartford, CT, May 19, 2003. *DLM Math*. With D. Clements (invited)
17. Keynote presentation, "Defining quality in early mathematics education," regional conference at Rutgers University, supported by the Carnegie Corp. *Building Blocks: Research-based early childhood mathematics curricula*. New Brunswick, NJ, July 10-11, 2002. With D. Clements (invited)
18. Keynote and one additional presentation, NYU-Corning Head Start Conference. *Math and Technology in the Early Years*. Geneva, NY, June 15, 2001. With D. Clements (invited)
19. Second Annual New York Graduate Mathematics Education Research Conference. 11/24/13. Four presentations: Students' development of geometric concepts in a specially-designed computer environment; Technology in mathematics education in elementary school; Visions for technology in mathematics education; and Redesigning Logo: Turtle Math as a new elementary mathematics environment. With D. H. Clements. (invited)
20. Detroit Area Council of Teachers of Mathematics Conference, Plymouth-Canton, MI. October 5, 1995. *Macintosh software for K-8 mathematics*.
21. Second Annual New York Graduate Mathematics Education Research Conference. 11/24/13. Four presentations: Students' development of geometric concepts in a specially-designed computer environment; Technology in mathematics education in elementary school; Visions for technology in mathematics education; and Redesigning Logo: Turtle Math as a new elementary mathematics environment. With D. H. Clements. (invited)
22. Illinois Council of Teachers of Mathematics 47th annual meeting and pre-conference. October 12, 1995. *Turtle Math: A computer environment and activities for elementary mathematics*. With D. H. Clements. (invited)
23. Association of Mathematics Teachers of New York State, Buffalo, NY. November 13, 1993. *Geo-Logo: Geometry Investigations*. With D. Clements and S. McMillen.

24. Seventh Annual 1993 New Jersey Educational Computing Conference, Montclair State College, Montclair, New Jersey, March 25-26, 1992. Four presentations or panels, including: *Investigations in Number, Data, and Space*, *Geo-Logo: A research-based Logo for elementary geometry* (with D. Clements), *Tumbling Tetrominoes* (with D. Clements)

#### **Presentations/Conferences: Local**

1. Two presentations, Marsico Institute for Early Learning and Literacy Community Lecture Series, University of Denver, Denver, CO, Oct 22-23, 2013. *Current State of of Early Childhood Mathematics Education; Myths and Misconceptions in Early Mathematics.*
2. Three presentations, Center for Science, Mathematics, and Computer Education and College of Education and Human Sciences, University of Nebraska-Lincoln, Oct 7-8, 2013. *Current State of the Field of Early Childhood Mathematics Education; Lessons from Research: The Building Blocks of Math; and Building Blocks and Other Math Curricula Preschool to Primary Grades.*
3. Diocese of Buffalo, ACS. March 26, 2010, Amherst, NY: *Lessons from Research.*
4. GSE Education Outreach Lecture, October 11, 2007 , Buffalo, NY. *Digital Kids, Analog Schools: The Importance of Integrating Technology into the Curriculum.*
5. Diocese of Buffalo. Friday, October 28, 2005, Buffalo, NY. *Mathematics Education: Lessons from Research.*
6. Graduate School of Education's Continuing Professional Education Breakfast Lecture Series (K-12). Thursday, October 20, 2005, Buffalo, NY. *Scaling up successful educational interventions.*
7. Presentation for the Williamsville Central Schools. *Geometry, transformations, and spatial sense in early childhood.* Williamsville, NY, Wednesday, August 31, 2005.
8. A series of presentations/workshops for the Buffalo Public Schools APLN Teachers. *Number sense in first grade.* Buffalo Public Schools, Buffalo, NY January 28, 2005, March 18, 2005.
9. Presentation for University of Buffalo's University and the World Lecture Series. *Early Mathematics Learning and Teaching.* Clemens Hall, UB, Buffalo, NY, 11/24/13. With D. Clements.
10. West Seneca Central Schools, West Seneca, NY, January 17, 1996, January 24, 1996. Workshops: *Educational change with Turtle Math.* With D. Clements.

11. University Iowa,, November 11 1995. Presentation: *Educational innovation with mathematics software.*
12. University North Carolina, Asheville, North Carolina, June 24-30 1995. Workshop: *Educational innovation with Turtle Math and other mathematics software.* With D. Clements.

## Awards

*Technology & Learning* Software of the Year award, 1995, in the category "Math," for *Turtle Math*, an educational software program designed, developed, and programmed by Douglas H. Clements & Julie Sarama.

<b>UNIVERSITY TEACHING AND SERVICE</b>
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## Teaching

LAI 693 "Technology in Mathematics Education"

LAI 540 "Improving Instructional in Elementary Mathematics Education"

## Dissertation and Thesis Committees

### Doctoral Committees Chaired

Mary Elaine Spitler, 2009

Nosisi Piyose, 2009

Janka Szilagyi, 2007

YongJoon Park, 2008 (co-chair)

Bardsley, Mary Ellen (co-chair), April 2006

Robin O'Dell, April 2005

Anne E. Izydorczak, 2002

### Doctoral Committees, Member

Carmen Brown

Jennifer McDonel, 2013

*Young Doo Choo*, 2013

Vidya Thirumurthy, 2003

David C. Wilson, 2002

### *Master Theses/Projects Chaired = (insert number)*

List Names

Date Defended

*James Bialsik*

May 2005

Julia Haywood

May 2005

## **Service**

Member, Implementation Oversight for Renew DU Research Projects committee, 2013-present

Chair, Department of Learning and Instruction, 2011-present

Director, Gifted Mathematics Program (GMP), 2011-present

Member, GSE's Educational Technology Committee, 2006-present

Member, LAI Web Redesign Committee, 2007-present

Member, search committee, mathematics education, 2002-2003

Member, Doctoral Studies Committee, 2000-2005

Program Directors Committee, Program Director, Early Childhood

GSE Envisioning Committee, 2005-present

Gifted Math Advisory Committee, 2006-present

Member, Advisory Committee, EON

Member, GSE Technology Advisory Committee, 2004-present

## **Service for Professional Organizations**

Member, Early Childhood Development Committee, United Way

Editor, "Early Childhood Corner," *Teaching Children Mathematics*, 1999-2004.

## **Memberships**

AERA	American Educational Research Association
ICCE	International Council for Computers in Education
NCTM	National Council of Teachers of Mathematics
PME	International Group for the Psychology of Mathematics Education