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Duquesne University

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Professional Preparation and Experience

Education

University of Pittsburgh, Pittsburgh, PA: Ed.D. Mathematics Education; April, 2006

Dissertation: Developing Secondary Mathematics Teachers' Knowledge of and Capacity to Implement Instructional Tasks with High Level Cognitive Demands. Advisor: Dr. Margaret S. Smith

University of Pittsburgh, Pittsburgh, PA: M.A. in Mathematics; December, 1996

Grove City College, Grove City, PA: B.S. in Mathematics/ Secondary Education; June, 1992
Magna cum Laude with Highest Honors in Mathematics Education

Academic Appointments

July 2006 - Present
Duquesne University, Pittsburgh, PA:
Associate Professor, Instruction and Leadership in Education
Director, Secondary Education Programs
Advisor, Graduate Secondary Mathematics Teaching Candidates

August 2005- May 2006
Slippery Rock University, Slippery Rock, PA:
Instructor, Elementary Education and Early Childhood
Advisor, Elementary Education Candidates
Student Teaching Supervisor, Elementary and Secondary Mathematics Teaching Candidates

August 1998 - August 2005
University of Pittsburgh, Pittsburgh, PA:
Research Assistant, Learning Research and Development Center
Adjunct Instructor, Mathematics Education

January 1993- August 1998
Butler Area School District, Butler, PA:
Mathematics Teacher, Butler Jr. High School

Professional Organizations

National Council of Teachers of Mathematics
American Educational Research Association
Association of Mathematics Teacher Educators

Pennsylvania Council of Teachers of Mathematics
Pennsylvania Association of Mathematics Teacher Educators
Association of Accredited Colleges of Teacher Education

Teaching

Duquesne University:
July 2006 - present
Graduate/Undergraduate Courses (cross-listed)
Teaching Secondary Mathematics
Teaching Middle Level Mathematics (Secondary and Middle Level Programs)
Supervising Secondary Mathematics Field Experience

Undergraduate Courses
PK-4 Numeracy Content Knowledge, PK-4 Numeracy Pedagogy
Supervising PK-4 Numeracy Field Experience

Slippery Rock University:
August 2005 - May 2006
Undergraduate Courses
Teaching Elementary Mathematics (4)

University of Pittsburgh:
August 2001-May 2004

Graduate Courses
 Teaching Secondary Mathematics, Secondary Mathematics Teaching Lab
 Teaching Elementary Mathematics

Teaching-Related Publications

Boston, M. (2013). 'Counting on' family time this summer? *Pittsburgh Catholic Magazine*. Family Life Issue, 2013.

Boston, M., Evans, M., Adeyemi, C., Fialkiewicz, D., Flynn, P., Metz, M.L. (2010). *Student Explorations in Mathematics* series. Reston, VA: National Council of Teachers of Mathematics.

Dixon, J. K., Ferreira, L., **Boston, M.**, Evans, M., Fialkiewicz, D., Flynn, P. (2009). *Student Explorations in Mathematics* series. Reston, VA: National Council of Teachers of Mathematics.

Nolan, E., **Boston, M.**, Dixon, J. K., Evans, M., Ferreira, L., Moore, T. (2008). *Student Explorations in Mathematics* series. Reston, VA: National Council of Teachers of Mathematics.

Boston, M., Smith, M. S., & Hillen, A. F. (2003). Building students' understanding of cross-multiplication. *Mathematics Teaching in the Middle School*. 9, 150-155.

Smith, M. S. & **Boston, M.** (2003). Creating rabbit pens. *Classroom Activities for the Learning and Teaching of Measurement: National Council of Teachers of Mathematics 2003 Yearbook*, (47-49). NCTM: Reston, VA.

Boston, M. & Smith, M. S. (2003). Providing opportunities for students and teachers to 'measure up.' *The Learning and Teaching of Measurement: National Council of Teachers of Mathematics 2003 Yearbook*. NCTM: Reston, VA.

Professional Development Books

Boston, M., Dillon, F. Smith, M.S., Miller, S. (2017). *Taking Action: Implementing the Effective Mathematics Teaching Practices Grades 9-12*. National Council of Teachers of Mathematics: Reston, VA.

Smith, M. S., Silver, E. A., Stein, M. K., **Boston, M.**, Henningsen, M., & Hillen, A. F. (2005). *Improving Instruction in Ratio and Proportion: Using Cases to Transform Mathematics Teaching and Learning, Volume 1*. Teacher's College Press: New York.

Smith, M. S., Silver, E. A., Stein, M. K., **Boston, M.**, Henningsen, M. (2005). *Improving Instruction in Geometry and Measurement: Using Cases to Transform Mathematics Teaching and Learning, Volume 3*. Teacher's College Press: New York.

Smith, M. S., Silver, E. A., Stein, M. K., Henningsen, M., **Boston, M.**, & Hughes, E. (2005). *Improving Instruction in Algebra: Using Cases to Transform Mathematics Teaching and Learning, Volume 2*. Teacher's College Press: New York.

Teaching-Related Presentations

Boston, M. Dillon, F., & Miller, S. (2017). Taking Action: Implementing Effective Teaching Practices in Grades 9-12 Presentation at the National Council of Teachers of Mathematics Annual Meeting, San Antonio, TX.

Boston, M. Dillon, F., & Miller, S. (2017). Taking Action: Implementing Effective Teaching Practices in Grades 9-12 Presentation at the National Council of Supervisors of Mathematics Annual Conference, San Antonio, TX.

Boston, M. Dillon, F., & Miller, S. (2016). Principles to Actions Professional Learning Toolkit: Effective Teaching Practices in High School. Presentation at the National Council of Teachers of Mathematics Annual Meeting, San Francisco, CA.

Dillon, F. & **Boston, M.** (2016). Principles to Actions Professional Learning Toolkit: Focus on Purposeful Questions and Productive Struggle. Presentation at the National Council of Supervisors of Mathematics Annual Conference, San Francisco, CA.

Bill, V., **Boston, M.**, Dillon, F., Hillen, A., Huinker, D., Smith, M. Steele, M. (2016). Supporting Teachers' Development of NCTM's Effective Mathematics Teaching Practices: An Exploration of New Resources. Presentation at the annual meeting of the Association of Mathematics Teacher Educators, Irvine, CA.

Boston, M. (2016). Improving Mathematical Discussions Using the IQA Lesson Observation Instrument. Presentation at the annual meeting of the Pennsylvania Council of Teachers of Mathematics, Seven Springs, PA.

Boston, M. (2016). Effective Mathematics Teaching Practices in High School Classrooms. Presentation at the annual meeting of the Pennsylvania Council of Teachers of Mathematics, Seven Springs, PA.

Boston, M. (2015). NCTM's "Principles to Actions" Professional Development Toolkit: Effective Teaching Practices in Secondary Mathematics. Presentation at the annual meeting of the Pennsylvania Council of Teachers of Mathematics, Lancaster, PA.

Boston, M. (2015). NCTM's "Principles to Actions" Professional Development Toolkit: Effective Teaching Practices in Middle Grades Mathematics. Presentation at the annual meeting of the Pennsylvania Council of Teachers of Mathematics, Lancaster, PA.

Boston, M. & Miller, S. (2015). Moving to Action: Effective Teaching Practices in the Secondary Grades. Presentation at the National Council of Teachers of Mathematics Annual Meeting, Boston, MA.

Akay, A. O. & **Boston, M. D. (2013).** Mathematics teachers' use of technology and IQA rubrics. Presentation at the annual meeting of the Pennsylvania Council of Teachers of Mathematics, Seven Springs, PA.

Boston, M. D. & Steele, M. S. (2012). Analyzing student work as a reflection on practice: Tools for research and professional development. Presentation at the annual meeting of the Association of Mathematics Teacher Educators, Fort Worth, TX.

Boston, M. D. (2011). The Instructional Quality Assessment as a learning tool for school leaders. Presentation at the annual meeting of the Association of Mathematics Teacher Educators, Irvine, CA.

Boston, M. D. (2010). Think globally, act locally: Using 'Student Explorations in Mathematics' in the classroom. Presentation at the annual meeting of the National Council of Teachers of Mathematics, San Diego, CA.

Boston, M. D. (2010). The point of good nutrition: Using 'Student Explorations in Mathematics' in the classroom. Presentation at the annual meeting of the National Council of Teachers of Mathematics, San Diego, CA.

Boston, M. D. (2009). Using the TI-73 to "rethink" middle school mathematics and social justice. Presentation at the annual meeting of the Pennsylvania Council of Teachers of Mathematics, Pittsburgh, PA.

Boston, M. D. (2009). Tasks, talk, and teachers' expectations: Using a research tool to assess (and improve) the quality of mathematics instruction. Presentation at the annual meeting of the Association of Mathematics Teacher Educators, Orlando, FL.

Boston, M. D. (2007). Moving past 'invert and multiply:' Using multiple representations to develop students' understanding of division of fractions. Presentation at the annual meeting of the Pennsylvania Council of Teachers of Mathematics, Valley Forge, PA.

Boston, M. D. (2007). Using students' work as a professional development tool for teachers of mathematics. Presentation at the annual meeting of the Pennsylvania Council of Teachers of Mathematics, Valley Forge, PA.

Smith, M. S. & **Boston, M. D. (2006).** Selecting and adapting rich mathematical tasks. Invited presentation to the Council of Presidential Awardees in Mathematics at the annual meeting of the National Council of Teachers of Mathematics, Atlanta, GA.

Smith, M. S., **Boston, M.**, & Steele, M. (2006). Focusing on challenging mathematical tasks: A strategy for improving teaching and learning. Presentation at the annual meeting of the Association of Mathematics Teacher Educators, Tampa, FL.

Boston, M. D. (2005). Using patterning tasks to promote algebraic reasoning. Presentation at the Grove City College 2005 Summer Education Conference.

Hughes, E. & **Boston, M.** (2004). The Mathematical Tasks Framework: A guide for lesson planning and reflection. Presentation at the annual meeting of the Association of Mathematics Teacher Educators, San Diego, CA.

Boston, M. (2003). Fostering students' understanding of long division. Presentation at the annual meeting of the Pennsylvania Council of Teachers of Mathematics, Pittsburgh, PA.

Smith, M. S. & **Boston, M.** (2001). Practice-based teacher development materials: What are they and why are they effective? Presentation at the annual meeting of the National Council of Supervisors of Mathematics, Orlando, FL.

Smith, M. S. & **Boston, M.** (1999). The use of cases in teacher professional development in mathematics. Presentation at the annual meeting of the National Council of Teachers of Mathematics, San Francisco, CA.

Grants for Teaching Activities

- May 2017-
October 2018 **Allegheny Intermediate Unit 3.** Mathematics-Science Partnership Grant, sub-award from Pennsylvania Department of Education. Consultant and professional development facilitator with AUI3 Mathematics Science Collaborative: \$16,200.
- July 2010 **Duquesne University, Office of Assessment and Learning.** Graduate Secondary Leading Teacher Program, ALOA Mini-Grant Recipient: \$2,500.
- May 2008 **Texas Instruments, Dallas, TX:**
Middle School Mathematics Teacher Educator Workshop and Equipment Award: \$7,500.

Invited Professional Development Presentations and Workshops

- March 2018 **M4 Conference,** Omaha, Nebraska. "Taking Action: Implementing Effective Teaching Practices in High School Classrooms." Featured Speaker.
- April 2017 **NCTM Annual Meeting,** San Antonio, TX. "Building Conceptual Understanding in Middle Grades Mathematics." Featured speaker.
- November 2016 **NCTM Innov8 Conference,** St. Louis, MO. "Principles to Actions' Effective Teaching Practices in High School Classrooms." Featured speaker.
- July 2016 **National Science Teacher Association STEM Conference,** Denver, CO. "Moving to Action: Effective Mathematics Teaching Practices in the Secondary Grades." Delivered invited session for NCTM.
- June 2016 **Unbounded Learning Inc.** "It's all about that TASK." Invited presentation.
- May 2016 **Pennsylvania Association of Mathematics Teacher Educators.** "Promoting Effective and Equitable Mathematics Instruction: Using Resources from NCTM's Principle to Actions Toolkit." Keynote Speaker.
- May 2016 **Association of Mathematics Teacher Educators.** "The Principles to Action Toolkit: Resources for Supporting Teachers' Development of NCTM's Effective Mathematics Teaching Practices." Invited Webinar.
- March 2016 **Laurel Highlands Mathematics Associations.** "Promoting Effective and Equitable Mathematics Instruction: Using Resources from NCTM's Principle to Actions Toolkit." Keynote Speaker.
- November 2015 **NCTM Regional** Nashville, TN. "Implementing High-Level Tasks: Using Student Work To Reflect on Instruction." Invited speaker.

- March 2015 **National Board Professional Teaching Standards**, Teaching and Learning Conference, Washington, D.C. “Moving to Action: Effective Mathematics Teaching Practices in the Secondary Grades.” Invited speaker.
- January 2014 **Association of Mathematics Teacher Educators**. “Publishing in the *Mathematics Teacher Educator* Journal.” Invited Webinar.
- October 2011-
February 2012 **Boston Public Schools**, Boston, MA. Professional development provider with Mathematics Leadership Team, Institute for Learning, University of Pittsburgh.
- November 2011 **Carnegie Learning, Inc.**, Pittsburgh, PA. “Using Patterning Tasks to Foster Algebraic Thinking.” Invited Webinar.
- July 2011 **Carnegie Learning, Inc.** National Mathematics Institute, Dallas, TX. Invited Speaker.
- October 2010 –
June, 2012 **Seneca Valley School District**, Cranberry, PA. Professional development provider for Elementary Mathematics Collaborative, “Improving Instruction in Mathematics.”
- August, 2010 **Fort Lewis College**, Durango, CO. “Analyzing Mathematical Tasks and Task Implementation” Invited workshop.
- December, 2009 **Midwestern Intermediate Unit IV**, PA. “Using Patterning Tasks to Promote Algebraic Thinking in Grades K-8.” Invited presentation.
- October, 2009 **Allegheny Mathematics Partnership**, Pittsburgh, PA. “Orchestrating Classroom Discourse.” Invited speaker.
- August - October, 2009 **Jefferson County School District**, Louisville KY. “Becoming Effective Instructional Leaders in Mathematics” Workshop for Principals.
- October, 2008 **Allegheny Mathematics Partnership**, Pittsburgh, PA. “Using High-level tasks to Differentiate Instruction in Mathematics.” Invited speaker.
- September 2008 -
June, 2009 **Sharon City Schools, PA; Wilson School District, PA; and Prince George’s County School District**, MD. Algebra Curricular Materials Pilot. Institute for Learning, University of Pittsburgh.
- September 2008 -
June, 2009 **Seattle Public Schools**, Seattle, WA. Middle School Mathematics Studio Project Teachers’ Development Group.
- March 2008,
May 2008 **Minneapolis Public Schools**, Presentations at Leadership Seminars Institute for Learning, University of Pittsburgh.
- September 2005 -
December 2007 **West Jefferson School District, Sharon City Schools**, PA Workshops for Middle and High School Mathematics Teachers.
- August 2000 -
August 2005 **Presentations with the Institute for Learning, University of Pittsburgh:** Pittsburgh Public Schools, Providence Middle Schools, Rhode Island Consortium of Schools, Bridgeport Public Schools, SCALE Project, Consortium of School Superintendents, and IFL Retreat (Colorado Springs)

Scholarship

Scholarly Publications

Boston M.D. & Candela, A.G. (2018). The instructional quality assessment in mathematics: A tool for researchers and practitioners to enhance students’ engagement with cognitively demanding tasks. *ZDM: Mathematics Education*. <https://doi.org/10.1007/s11858-018-0916-6>.

Boston, M. D., Henrick, E. C., Gibbons, L. K., Berebitsky, D., & Colby, G. T. (2016). Investigating how to support principals as instructional leaders in mathematics. *Journal of Research on Leadership Education*, 1942775116640254.

Boston, M., Bostic, J., Lesseig, K. & Sherman, M. (2015). A comparison of mathematics classroom observation protocols. *Mathematics Teacher Educator*, 3, 154-175.

Boston, M. D., & Wilhelm, A. G. (2015). Middle school mathematics instruction in instructionally-focused urban districts. *Urban Education*, 52(7), 829-861.

Boston, M. D., & Steele, M. (2014). Analyzing students' work to reflect on instruction: The instructional quality assessment as a tool for instructional leaders. *Journal of Mathematics Education Leadership*, 15, 21-33.

Boston, M. D. (2013). Connecting changes in secondary mathematics teachers' knowledge to their experiences in a professional development workshop. *Journal of Mathematics Teacher Education*. [DOI: 10.1007/s10857-012-9211-6]

Boston, M. D. (2012). Assessing the quality of mathematics instruction. *Elementary School Journal*, 113, 76-104.

Boston, M. D. & Smith, M. S. (2011). A 'task-centric approach' to professional development: Enhancing and sustaining mathematics teachers' ability to implement cognitively challenging mathematical tasks. *ZDM: International Journal of Mathematics Teacher Education*, 43, 965-977 [DOI 10.1007/s11858-011-0353-2].

Boston, M. D. & Smith, M. S. (2009). Transforming secondary mathematics teaching: Increasing the cognitive demands of instructional tasks used in teachers' classrooms. *Journal for Research in Mathematics Education*, 40(2), 119-156.

Matsumura, L. C., Garnier, H. Slater, S. C., & **Boston, M.** (2008). Toward measuring instructional interactions 'at-scale.' *Educational Assessment*, 13(4), 267-300.

Boston, M. D. (2006). *Developing secondary mathematics teachers' knowledge of and capacity of implement instructional tasks with high-level cognitive demands* (Doctoral dissertation, University of Pittsburgh). *Dissertation Abstracts International* (Publication No. AAT 3223943).

Boston, M. & Wolf, M. K. (2006). Assessing academic rigor in mathematics instruction: The development of Instructional Quality Assessment Toolkit. National Center for Research on Evaluation, Standards, and Student Testing (CRESST) Report #672.

Crosson, A. C., **Boston, M.**, Levison, A., Matsumura L. C., Resnick, L. B., Wolf, M. K., & Junker, B. W. (2006). Beyond summative evaluation: The Instructional Quality Assessment as a professional development tool. National Center for Research on Evaluation, Standards, and Student Testing (CRESST) Report #691.

Matsumura, L. C., Slater, S. C., Junker, B., Peterson, M., **Boston, M.**, Steele, M., & Resnick, L. (2006). Measuring reading comprehension and mathematics instruction in urban middle schools: a pilot study of the instructional quality assessment. National Center for Research on Evaluation, Standards, and Student Testing (CRESST) Report #681.

Book Chapters, Edited Volumes, and Conference Proceedings

Goffney, I., Gutierrez, R. & **Boston, M.** (Eds.) (forthcoming: April 2018). *Annual Perspectives in Mathematics Education 2018: Rehumanizing Mathematics for Black, Latina/o, and Indigenous Children*. National Council of Teachers of Mathematics: Reston, VA.

Akcay, A.O. & **Boston, M.** (accepted). Preservice mathematics teachers' effective use of technology: Analyzing the cognitive demands of technology-based instructional activities. In M. Strutchens (Ed.), *ICME-13 Monograph: Preservice Mathematics Education of Secondary Teachers*: Accepted with revisions April 2017.

West, L. & **Boston, M.** (Eds.) (2017). *Annual Perspectives in Mathematics Education 2017: Reflective and Collaborative Processes to Enhance Mathematics Teaching*. National Council of Teachers of Mathematics: Reston, VA.

Boston, M., Madler, K. & Cutone, C. (2017). Implementing tasks that promote reasoning and problem solving: Successes and obstacles in making "day-to-day" mathematics high-level. In D. Spangler and J. Wanko (Eds.), *Research Companion to "Principles to Action."* National Council of Teachers of Mathematics: Reston, VA.

Akçay, A.O. & **Boston, M.** (2016). An examination of pre-service mathematics teachers' levels of technology implementation. In *Proceedings of Society for Information Technology & Teacher Education International Conference 2016* (pp. 2467-2471). Chesapeake, VA: Association for the Advancement of Computing in Education (AACE).

Boston, M. D. (2015). Selecting and implementing cognitively challenging instructional tasks: A pathway for engaging students in the common core standards for mathematical practice. *National Council of Teachers of Mathematics, More Lessons Learned from Research, Volume 1*. Reston, VA: National Council of Teachers of Mathematics.

Gokbel, E. N., & **Boston, M. D.** (2015). Considering students' responses in determining the quality of teachers' questions during mathematical discussions. In *Proceedings of the 37th annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (p. 1172).

Kessler, A., **Boston, M.**, & Stein, M.K. (2014). Conceptualizing Teacher's Practices in Supporting Students' Mathematical Learning in Computer-Directed Learning Environments. Report published in *Proceedings of the 11th International Conference of the Learning Sciences*, Boulder, CO.

Boston, M. D. (2014). Assessing instructional quality in mathematics classrooms through collections of students' work. In (Eds. Y. Li & E. Silver), *Transforming Mathematics Instruction: Multiple Approaches and Practices* (501-523). Switzerland: Springer International Publishing.

Akçay, A. & **Boston, M.** (2014). Pre-service teachers' integration of technology into mathematics education. In M. Searson & M. Ochoa (Eds.), *Proceedings of Society for Information Technology & Teacher Education International Conference 2014* (pp. 2911-2912). Chesapeake, VA: AACE.

Hughes, E. A., Smith, M. S., **Boston, M. D.**, & Hogel, M. (2008). Case stories: Supporting teacher reflection and collaboration on the implementation of cognitively challenging mathematical tasks. In F. Arbaugh & P. M. Taylor (Eds.), *Inquiry into Mathematics Teacher Education*, 71-84. Association of Mathematics Teacher Educators (AMTE) Monograph Series, Volume 5. AMTE: Reston, VA.

Grants and Funding

- May 2016-17 **Spencer Foundation Conference Grant.** Equitable mathematics classroom observation tools. Grant writer and coordinator (with Jonee Wilson): \$50,000.
- July 2013-16 **PDE Title II Mathematics Science Partnership (MSP) Grant.** PA Intermediate Unit 1, STEM Center "C3" Project. External Evaluator: Year 1, \$12,000; Year 2, \$10,500; Year 3, \$24,200.
- October 2013-18 **National Science Foundation.** Designing for Equity by Thinking in and About Mathematics (DEbT-M) Project, NSF #1321216. External Evaluator (with Carol Parke): \$614,000.
- September 2012 **PDE Title II Mathematics Science Partnership (MSP) Grant.** PA Intermediate Unit 1, STEM Center "Building Bridges to Algebra" Project. External Evaluator: \$13,900
- September 2012 **Duquesne University, Department of Instruction and Leadership in Education (DILE)**
- January 2012 Exploring the Quality of On-line Mathematics Instructional Programs \$3000 (Jan) and \$1750 (Sept)
- June 2010 **Heinz Endowments, Pittsburgh, PA.** Collaboration with Carnegie Learning, Inc. Summer Workshops to Improve Instruction in Mathematics: \$25,000
- Fall 2009 **University of Pittsburgh, Pittsburgh, PA: Institute for Learning**
Pittsburgh Public Schools Mathematics Curriculum Review Project: \$15,500
- Spring 2008, Fall 2006 **National Science Foundation.** Enhancing Secondary Mathematics Teacher Preparation (ESP) Project Follow-Up Study. PI with Margaret Smith, University of Pittsburgh. Two-year no-cost extension to NSF #0301962 (original funding amount: \$998K).
- Fall 2007 **Duquesne University:** Presidential Writing Award Recipient: \$5,000

- May 2005-06 **University of Pittsburgh, Pittsburgh, PA:** School of Education Dissertation Research Grant: \$1,500
- May 2004-07 **National Science Foundation.** Enhancing Secondary Mathematics Teacher Preparation (ESP) Project. Assisted with Grant Writing and served as Project Director. Principal Investigators Ellen Ansell, Paul Gartside, Beverly Michael, and Margaret Smith. NSF #0301962: \$998,635.

Additional Research Experiences

- Ongoing **Instructional Quality Assessment Mathematics Toolkit.** Rater Training and Research Consultant for various research projects.
- July 2017-2020 **Examining Teacher Math Anxiety as Related to Student Outcomes,** Advisory Board and Research Consultant. PI Colleen Ganley (Florida State University).
- May 2007-15 **Middle School Mathematics and the Institutional Setting of Teaching, MIST and MIST2 Project,** Research Consultant. PIs Paul Cobb and Thomas Smith (Vanderbilt University).
- October 2014-15 **The Primary Grades Mathematics Study.** IQA Rater Training and Research Consultant. PI Juli Dixon (University of Central Florida).
- June 2011-14 **Aspire Project.** Advisory Board. PI Pat Thompson (Arizona State University).
- June 2011-14 **Assessment Work-Sample Method (AWSM) Project.** Advisory Board. PI Andrea Beesley (Mid-Continental Center for Research on Education and Learning, Denver, CO).
- June 2011-
June 2013 **ITEST Robotics Project,** Research Consultant. PIs Christian Schunn and Mary Kay Stein (University of Pittsburgh), and Robin Shoop (Carnegie Mellon University).
- May 2010-
December 2011 **Summer Workshops to Improve Instruction in Mathematics,** Principal Investigator. Duquesne University and Carnegie Learning, Inc.
- May 2009-
December 2011 **Designing Learning Experiences to Enhance School Leadership in Mathematics Education** Project Director, with Erin Henrick and Paul Cobb (**Vanderbilt University**)
- August 2000 -
August 2005 **Instructional Quality Assessment (IQA) Project,** Lead Developer, IQA Mathematics Rubrics PIs Lauren Resnick, Brian Junker, and Lindsay Clare Matsumura (University of Pittsburgh).
- August 1998 -
August 2003 **Cases of Mathematics Instruction to Enhance Teaching (COMET),** Graduate Research Assistant Principal investigators Margaret Smith, Edward Silver, and Mary Kay Stein (University of Pittsburgh).

Research Presentations

- Candela, A. and **Boston, M.** (2018). Using the IQA as a Professional Development Tool with Mathematics Teachers. Annual Meeting of the Association of Mathematics Teacher Educators, Houston, TX.
- Bostic, J. Lesseig, K., Sherman, M., and **Boston, M.** (2018). Mathematics classroom observation protocols: Informing future research and practice. Annual Meeting of the Association of Mathematics Teacher Educators, Houston, TX.
- Bostic, J. Lesseig, K., Sherman, M., and **Boston, M.** (2017). Classroom Observation Protocols: Choose Your Own Tool. Research report presented at the National Council of Teachers of Mathematics Research Conference, San Antonio, TX.
- Akçay, A.O. & **Boston, M.** (2016). Preservice mathematics teachers' effective use of technology: Analyzing the cognitive demands of technology-based instructional activities. Paper presented at the 13th International Congress on Mathematics Education, Hamburg, Germany.
- Boston, M.,** Munter, C., Parke, C., Thomas-Browne, C., Shekell, C. and Haines, C. (2016). Formative intervention research to enhance equitable mathematics instruction: Results and feedback from integrating multiple data sources. Paper presented at the Research Conference of the National Council of Teachers of Mathematics Annual Meeting, San Francisco, CA.

Boston, M. (2016). Using observation data to support equitable and ambitious mathematics instruction. Paper presented at the Annual Meeting of the American Educational Research Association, Washington, DC.

Akçay, A. O., & **Boston, M.** (2016, June). Mathematics teachers' use of technology. Presentation at International Society for Technology in Education Conference, Atlanta, GA.

Boston, M. (2015). Successes and barriers in evaluating equitable practices in teaching mathematics. Paper presented at the Research Conference of the National Council of Teachers of Mathematics Annual Meeting, Boston, MA.

Parke, C. & **Boston, M.** (2015). Connecting teachers' knowledge and practice to student achievement in mathematics. Paper presented at the Annual Meeting of the American Educational Research Association, Chicago, IL.

Akçay, A., & **Boston, M.** (2015). A comparison study of fractions content in mathematics textbooks from the U.S. and Turkey. Paper presented at the Annual Meeting of the American Educational Research Association, Chicago, IL.

Gokbel, E. N., & **Boston, M. D.** (2015). Considering students' responses in determining the quality of teachers' questions during mathematical discussions. In Paper presentation at the 37th annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education, East Lansing, MI.

Kessler, A., **Boston, M.**, Stein, M. K. (2014). Conceptualizing Teachers' Practices in Supporting Students' Mathematical Learning in Computer-Directed Learning Environments. Paper presented at the International Conference of the Learning Sciences, Boulder, CO.

Boston, M. D., Henrick, E. C. and Gibbons L. (2014). Enabling Principals to Support High Quality Mathematics Instruction. Presentation at the National Conference of Supervisors of Mathematics, New Orleans, LA.

Boston, M., Kessler, A., & Stein, M.K. (2014). Conceptualizing the Teacher's Role in Supporting Students' Mathematical Learning in Computer-Directed Learning Environments. Paper presented at the Annual Meeting of the American Educational Research Association, Philadelphia, PA.

Sherman, M., Lesseig, K.L., Bostic, J. & **Boston, M.** (2014). A comparison of commonly used mathematics classroom observation tools. Paper presented at the Annual Meeting of the Association of Mathematics Teacher Educators, Irvine, CA.

Akçay, A. O., & **Boston, M.** (2014, June). *Mathematics teachers' use of technology*. Poster session will be presented at International Society for Technology in Education Conference, Atlanta, GA.

Akçay, A. O., & **Boston, M.** (2014, March). *Integrating educational technology into mathematics education*. Roundtable session will be presented at Society for Information Technology and Teacher Education, Jacksonville, FL.

Boston, M. D., Stein, M. K., Kessler, A. (2013). Teaching mathematics in virtual environments. Paper presentation at the Research Pre-session of the National Council of Teachers of Mathematics Annual Meeting, Denver, CO.

Boston, M. D., Akçay, A. O., & Henderson, V. (2013). *Quality of mathematics curricula used in cyber-school environments*. Paper presented at the Research Pre-session of the 2013 Annual Meeting of the National Council of Teachers of Mathematics. Denver, CO.

Steele, M. S. & **Boston, M. D.** (April, 2012). Using student work as a reflection on instruction. Paper presentation at the Research Pre-session of the National Council of Teachers of Mathematics Annual Meeting, Philadelphia, PA.

Colby, G. & **Boston, M. D.** (April 2012). Examining instructional quality and student achievement in mathematics. Paper presentation at the Research Pre-session of the National Council of Teachers of Mathematics Annual Meeting, Philadelphia, PA.

Boston, M. D. (April 2012). Tools of the Trade, Part 3. Invited presentation at the Research Pre-session of the National Council of Teachers of Mathematics Annual Meeting, Philadelphia, PA.

King, S. O., Stein, M. K., Schunn, C., & **Boston, M.** (April, 2012). Designing educative teacher guides for informal learning. Paper presentation at the annual meeting of the American Education Research Association, Vancouver, CN.

Boston, M.D., Henrick, E. C., & Gibbons, L. K. (2011, November). Promoting academic excellence and systemic change by positioning principals as content-area instructional leaders: The case of mathematics. Paper presentation at the University Council for Educational Administration Convention, Pittsburgh, PA.

Berebitsky D., Henrick, E. C., Larbi-Cherif, A., & **Boston, M.D.** (2011, November). Developing instructional leadership through content-specific professional development. Paper presentation at the University Council for Educational Administration Convention, Pittsburgh, PA.

Colby, G., **Boston, M.D.** & Smith, T.M. (2011, September). Examining relationships between instructional quality and student achievement in middle-grades mathematics. Paper presentation at the Fall 2011 Conference of the Society for Research on Educational Effectiveness, Washington, D.C.

Boston, M.D. (2011, April). Connecting teachers' learning and instructional change to professional development experiences. Paper presentation at the Research Pre-session of the National Council of Teachers of Mathematics Annual Meeting, Indianapolis, IN.

Boston, M.D. & Colby, G. (2011, April). Identifying meaningful aspects of mathematics instruction. Paper presentation at the annual meeting of the American Education Research Association, New Orleans, LA.

Boston, M.D. & Gibbons, L. (2011, April). Using classroom observation instruments to improve principal's capacity as instructional leaders in mathematics. Paper presentation at the annual meeting of the American Education Research Association, New Orleans, LA.

Garrison, A. & **Boston, M.D.** (2011, April). Assessing instructional quality in mathematics to provide pathways for school improvement. Paper presentation at the annual meeting of the American Education Research Association, New Orleans, LA.

Colby, G. T., Gibbons, L. K., Henrick, E. C., Wong, J. W. & **Boston, M.D.** (2010, October) Supporting middle-grades principals as instructional leaders in mathematics. Paper presentation at the University Council for Educational Administration Convention, New Orleans, LA.

Boston, M. D. (2009, April). Assessing mathematics teachers' instructional practices. Paper presentation at the Research Pre-session of the National Council of Teachers of Mathematics Annual Meeting, Washington, D.C.

Boston, M. D., & Smith, M. S. (2009, April). Are mathematics teachers' instructional improvements sustained over time? Paper presentation at the Research Pre-session of the National Council of Teachers of Mathematics Annual Meeting, Washington, D.C.

Boston, M. D. (2009, January). Linking professional development to changes in secondary mathematics teachers' knowledge of cognitive demands. Paper presentation at the 2009 Hawaii International Conference on Education, Honolulu, HI.

Boston, M.D. & Smith, M.S. (2008, March). Linking professional development to changes in secondary mathematics teachers' knowledge and instructional practices. Paper presentation at the annual meeting of the American Education Research Association, New York, NY.

Smith, M.S., & **Boston, M.D.** (2008, March). Examining the instructional practices of mathematics teachers over time: Are instructional improvements sustained? Paper presentation at the annual meeting of the American Education Research Association, New York, NY.

Boston, M.D. (2008, February). Using classroom artifacts as evidence of quality instruction in mathematics. Paper presentation at the Annual Conference of the Association of American Colleges of Teacher Education, New Orleans.

Boston, M. D., & Smith, M. S. (2007, April) Linking professional development to changes in teachers' selection and implementation of cognitively challenging tasks. Paper presentation at the Research Pre-session of the National Council of Teachers of Mathematics. Atlanta, GA.

Matsumura, L. & **Boston, M.** (2006, April). Measuring the quality of mathematics instruction in urban elementary and middle schools. Paper presentation at the annual meeting of the American Education Research Association, San Francisco, CA.

Boston, M. (2004, April). Assessing academic rigor in mathematics instruction: The development of Instructional Quality Assessment Toolkit. Paper presentation at the annual meeting of the American Education Research Association, San Diego, CA.

Boston, M. (2003, April). Taking advantage of openings in the curriculum to promote teachers' learning from cases. Paper presentation at the annual meeting of the American Education Research Association, Chicago, IL.

Honors, Awards, and Recognitions

January 2015	Named Series Editor for NCTM's 2017-2019 Annual Perspectives in Mathematics Education
June 2013	Invited Colloquium Speaker, University of Georgia, Mathematics Graduate Student Association
July 2013	Invited Panelist, Spencer Foundation forum on "Mathematics Instruction for Perseverance"
February 2012	Invited Speaker, Maseeh Mathematics and Statistics Colloquium Series, Portland State University
September 2010	First Annual Robert L. Morton Lecturer, Ohio University
May 2008	Texas Instruments Mathematics Teacher Educator Award
February 2008	2008 Outstanding Dissertation Award, Association of Teacher Educators
June 2007	Presidential Scholar Award, Duquesne University

Service

Professional

Ongoing	Dissertation support and on-line training for doctoral students using the IQA.
Ongoing	Reviewer: <i>Cognition and Instruction</i> , <i>Elementary School Journal</i> , <i>International Journal of STEM Education</i> , <i>Journal of Mathematical Behavior</i> , <i>Journal of Mathematics Teacher Education</i> , <i>Journal of Research on Leadership Education</i> , <i>Journal for Research in Mathematics Education</i> , <i>Mathematical Thinking and Learning</i> , <i>Measurement: Interdisciplinary Research and Perspectives</i> , <i>NCSM Journal of Mathematics Education Leadership</i> , <i>Teaching and Teacher Education</i> , <i>Urban Education</i> , <i>ZDM: International Journal of Mathematics Teacher Education</i> ; National Council of Teachers of Mathematics Research Pre-Session, American Educational Research Association Division K, Division L, and SIG-RME; Association of Mathematics Teacher Educators.
February 2018	AMTE Mentoring Sessions: Planning a Mathematics Methods Course, Submitting a Manuscript to <i>MTE</i> . AMTE Annual Meeting, Houston, TX.
April 2017	Organized a symposium at the National Council of Teachers of Mathematics Annual Meeting for APME 2017 authors to showcase their work.
March 2017	Organized and conducted the "Equitable Mathematics Classroom Observation Tools" conference for 40 scholars in the fields of classroom observation research, equitable mathematics instruction and educational measurement, using funding from the Spencer Foundation.
June 2016-18	Series Editor for NCTM's 2017-2018 Annual Perspectives in Mathematics Education (APME).
April 2016	NCTM Mentoring Session: Writing Grant Proposals (with Jon Bostic), NCTM Annual Meeting, San Francisco, CA.

September 2015	National Science Foundation Proposal Review Committee for CAREER Grants.
October 2014	Association of Mathematics Teacher Educators, Formative Assessment Working Group.
September 2014-16	NCTM Principles to Action Professional Development Toolkit Team.
May 2014 –16	Chair, Elections Committee, Pennsylvania Association of Mathematics Teacher Educators.
August 2013- May 2015	Editorial Panel, Annual Perspectives in Mathematics Education 2015 Volume.
May 2013	External Reviewer of Mathematics Education Program, Millersville State University, PA.
Jan 2011 – May 2015	Associate Editor, <i>Mathematics Teacher Educator</i> .
July 2010 -2013	Consulting Editor, <i>Journal of Educational Research</i> .
September 2010	Member of Award committee for international prize, “Excellence in Design for Education in Science or Mathematics.”
May 2009	National Science Foundation Proposal Review Committee for Discover Research K-12 Grants
June 2007 - 2009	National Council of Teachers of Mathematics, Student Math Notes Committee (Chair, 2009).
May 2008 - 2010	Pennsylvania Association of Mathematics Teacher Educators, Secretary.
Spring 2001	Pennsylvania Council of Teachers of Mathematics, 2001/2002 Yearbook Reviewer.

University, School, or Department

Ongoing	NCATE/CAEP and PDE Report Writer, Secondary Mathematics Graduate and Undergraduate Programs, Duquesne University.
August 2016-present	Faculty Advisor (with Xia Chao), Duquesne Chapter of Student-Pennsylvania State Education Association (S-PSEA).
2015-2016	Duquesne STEM Initiative, University Representative at AACTE STEM Conference, Seattle, WA.
2014-2016	Chair, Mentoring Committee for New Faculty, Dr. Rachel Ayieko.
2013-2015	Mentoring Committee for New Faculty, Dr. Sandra Quinones.
September 2013	Chair of Search Committee, Mathematics Education Faculty Search, Duquesne University.
2012-2014	Provided mathematics support for the Spiritan Learning Center, including piloting a pre- and post-test and arranging for secondary mathematics education students to serve as tutors for Duquesne’s students in the Spiritan program.
2011-2016	School of Education, Institutional Review Board, Duquesne University.
2011-2015	School of Education, Department of Instruction and Learning Representative to Academic and Curriculum Committee (ACC), Duquesne University.
May 2011	Teacher Education Council, Duquesne University.
September 2010	Search Committee, Spanish- Spanish Education Faculty Search, Duquesne University.
July 2008 – Dec 2015	Director, Graduate Secondary Education Programs, Duquesne University.

July 2008 - present Leading Teacher Quality Circle, Duquesne University.

Community Service

Ongoing Orchestrate opportunities for Duquesne University secondary and elementary mathematics education students to enhance mathematics learning in the Pittsburgh region, including: (a) tutoring at Manchester Charter School Afterschool Program, Allegheny General Hospital, the Wireless Neighborhoods Program, and Pittsburgh Public Schools; (b) creating and donating mathematics activities to Salvation Army Family Shelter; (c) participating in Family Math Night at Pittsburgh Public Schools Greenway Professional Development Center, Penn Hills Elementary School, Pittsburgh Urban Charter K-5, and West Jefferson Hills School District; (d) designing a summer algebra 'camp' for local schools.

April 2017 Invited Speaker, American Association of University Women Girls Recognition Night, Community College of Beaver County.

Fall 2013 Professional development for mathematics teachers, Oakland Catholic High School.

November 2009 - May 2010 PA Midwestern Intermediate Unit IV Mathematics Steering Committee, Higher Education Liaison.

December 2009 Consultant on the Techgyrls Robotics Project (Greater Pittsburgh YWCA).