

## Background

### Education

- Ph.D. Educational Psychology, University of Wisconsin-Madison, January 2008  
Dissertation: "A design-based case study of undergraduates' conceptions of limits,"  
Advisor: Dr. Mitchell Nathan
- M.A. Mathematics, University of Wisconsin-Madison, August 2006
- M.S. Educational Psychology, University of Wisconsin-Madison, December 2004  
Thesis: "Visualizing algebraic reasoning,"  
Advisor: Dr. Richard Lehrer
- B.A. Mathematics, University of Chicago, June 1998

### Professional Experience

- Assistant Professor, University of Maine, Department of Mathematics and Statistics, 2018 – present
- Clinical Assistant Professor & Director, Mathematical Sciences Learning Center, University of Illinois at Chicago, Department of Mathematics, Statistics & Computer Science, 2016 – 2018
- Assistant Professor, Wright State University, Department of Mathematics and Statistics & Department of Teacher Education, 2007 – 2014
- Instructor, University of Wisconsin-Madison, PEOPLE Program, 2002 – 2007
- Instructor/Teaching Assistant, University of Wisconsin-Madison, Department of Mathematics & Department of Educational Psychology, 1998 – 2006
- Instructor/Teaching Assistant, Johns Hopkins University, Center for Academic Advancement, 1997 – 1999
- Teaching Assistant, University of Chicago, Department of Mathematics, 1995 – 1998

### Professional Memberships

- American Educational Research Association (AERA), 2006 – present
- Mathematical Association of America (MAA), 2006 – present
- SIGMAA on Research in Undergraduate Math Education (RUME), 2008 – present
- National Council of Teachers of Mathematics (NCTM), 2008 – present
- Ohio Council of Teachers of Mathematics (OCTM), 2008 – 2014
- Wright State University Area Council Teachers of Mathematics (WSUACTM), 2008 – 2014

### Teaching Awards and Achievements

- HOPE (Honoring Our Professors' Excellence) Award, Campus Housing, University of Illinois at Chicago, Spring 2017
- Sustained Excellence in Teaching Award, Department of Mathematics, University of Wisconsin – Madison, Spring 2003
- Excellence in Teaching Award, Department of Mathematics, University of Wisconsin – Madison, Spring 2000

## Scholarship

### Journal Articles

Weinberg, A., Wiesner, E., Benesh, B. & Boester, T. (2012). Undergraduate Students' Self-Reported Use of Mathematics Textbooks. *PRIMUS*, 22, 2, 152-175.

### Proceedings

- Boester, T. (2017, February). How Limit can be Embodied and Arithmetized: A Critique of Lakoff and Núñez. *Proceedings of the Twentieth Annual Conference on Research in Undergraduate Mathematics Education* (pp. 383-397). San Diego, California. <http://sigmaa.maa.org/rume/RUME20.pdf>
- Boester, T. & Talbert, A. (2012, November). Teaching absolute value through a distance-based conception. *Proceedings of the 34th Annual Conference of the North American Chapter of the International Group for the Psychology of Mathematics Education* (pp. 969-972). Kalamazoo, Michigan. <http://www.pmena.org/pmenaproceedings/PMENA%2034%202012%20Proceedings.pdf>
- Boester, T. (2011, February). Designing and Implementing a Limit Diagnostic Tool. *Proceedings of the Fourteenth Annual Conference on Research in Undergraduate Mathematics Education, Volume 3: Contributed Research Reports* (pp. 24–28). Portland, Oregon: The Special Interest Group of the MAA for Research in Undergraduate Mathematics Education. [http://sigmaa.maa.org/rume/RUME\\_XIV\\_Proceedings\\_Volume\\_3.pdf](http://sigmaa.maa.org/rume/RUME_XIV_Proceedings_Volume_3.pdf)
- Boester, T. (2010, February). Testing Conceptual Frameworks of Limit: A Classroom-Based Case Study. *Proceedings of the Thirteenth Annual Conference on Research in Undergraduate Mathematics Education*. Raleigh, North Carolina: The Special Interest Group of the MAA for Research in Undergraduate Mathematics Education. <http://sigmaa.maa.org/rume/crume2010/Archive/Boester.pdf>
- Ely, R. & Boester, T. (2010, February). Point/Counterpoint: Should We Teach Calculus Using Infinitesimals? *Proceedings of the Thirteenth Annual Conference on Research in Undergraduate Mathematics Education*. Raleigh, North Carolina: The Special Interest Group of the MAA for Research in Undergraduate Mathematics Education. <http://sigmaa.maa.org/rume/crume2010/Archive/Ely&Boester.pdf>

### Book Chapters

Boester, T., & Lehrer, R., (2007). Visualizing algebraic reasoning. In Kaput, J., Carraher, D. W., & Blanton, M. (Eds.), *Algebra in the Early Grades*. Mahwah, NJ: Erlbaum.

### Creative Scholarship

Contributor of problems, UW-Madison Mega Math Meet competition for elementary/middle school students, 2002 – 2008.

Puzzle columnist, *Imagine* magazine (Center for Talented Youth/Johns Hopkins University), 1993 – 2018. Examples can be found at <http://www.knossosgames.com>.

### Research Grants

- Boester, T. (2010). Mini-sabbatical (half-time course release, spring quarter) for continuing research in MTH348, Concepts of Calculus for Middle School Teachers. Granted by Department of Mathematics & Statistics, Wright State University.
- Boester, T. & Mathews, S. (2008). *Diagnostic Algebra Assessments for Pre-Service Middle School Teachers*. West Ohio Center of Excellence for Science and Mathematics Education (We-EXCEL). Application submitted 2/18/08, approved 3/27/08. Grant period: 4/1/08 to 5/31/11 for \$8000, fully funded.
- Boester, T. (2008). *Dayton Public Schools and WSU: Mathematics Inquiry Professional Development Program for Grades 6-12 Teachers*. Ohio Department of Education. Monthly professional development sessions began August, 2008, directed by Shannon Driskell (University of Dayton, 6th – 8th grade DPS teachers) and Rebecca Krakowski (University of Dayton, 9th grade DPS teachers). Grant period: 8/1/08 to 6/30/09 for \$162,899, reduced from \$192,899 because of state budget cuts.

### Invited Presentations

- Boester, T., Maliwal, A. & Zoroya, T. (2019, November). Focusing on Noncognitive Factors in Mathematics. The Maine Center for Research in STEM Education Fall Summit 2019, Orono, Maine.
- Boester, T. (2019, June). *Helping Students Understand Covariation in Linear and Exponential Functions*. The Maine Center for Research in STEM Education Summer Conference 2019, Orono, Maine.
- Boester, T. (2019, June). *A Workshop on Building Function Explorations Using Desmos*. The Maine Center for Research in STEM Education Summer Conference 2018, Orono, Maine.
- Boester, T. (2019, April). *Scaffolding Student Thinking: Two Examples of Describing Changing Quantities*. The University of Maine Department of Mathematics and Statistics Colloquium Series, Orono, Maine.
- Boester, T. (2018, October). *Directly Supporting a Second Conceptual Structure: The Case of the Formal Definition of Limit*. The Maine Center for Research in STEM Education Colloquium Series, Orono, Maine.
- Boester, T. (2018, June). *An Example of Action Research: Absolute Value*. The Maine Center for Research in STEM Education Summer Conference 2018, Orono, Maine.
- Boester, T. (2018, June). *A Workshop on Using Distance to Teach Absolute Value*. The Maine Center for Research in STEM Education Summer Conference 2018, Orono, Maine.
- Boester, T. (2012, October). *An Example of Using Action Research to Help a Pre-service Teacher Study Pedagogical Content Knowledge*. Special Session on Issues in the Preparation of Secondary Teachers of Mathematics, AMS Fall Central Sectional Meeting, Akron, Ohio.
- Boester, T. (2010, January). *A Creativity Hierarchy for Using Puzzles in Classrooms*. Plenary talk presented at the 22nd Annual Sarah D. Barder Conference, Marina del Rey, California.
- Mathews, S. & Boester, T. (2008, December). *Conceptions of Absolute Value*. Wright State University Area Council of Teachers of Mathematics (WSUACTM), Wright State University.

### Conference Presentations

- Boester, T. (2019, August). *Characterizing Failure: The Case of Precalculus*. MAA MathFest, Cincinnati, Ohio.
- Boester, T. (2018, February). *A Primer on Action Research*. 20th Annual Chicago Symposium Series, Excellence in Teaching Mathematics and Science: Research and Practice, Chicago, Illinois.
- Boester, T. (2017, February). *How Limit can be Embodied and Arithmetized: A Critique of Lakoff and Núñez*. Special Interest Group of the MAA, Twentieth Conference on Research in Undergraduate Mathematics Education, San Diego, California.
- Boester, T. (2016, August). *Using Oral Exams to Reinforce Calculus Concepts*. MAA MathFest, Columbus, Ohio.
- Boester, T. (2014, January). *Relating Delta and Epsilon: How Students Graphically Create an Understanding of the Formal Definition of Limit at a Point*. Joint Mathematics Meetings, Baltimore, Maryland.
- Boester, T. & Talbert, A. (2013, October). *Teaching Absolute Value Inequalities Using the Idea of Distance*. NCTM 2013 Regional Conference & Exposition, Baltimore, Maryland.
- Boester, T. (2013, August). *Using Inquiry-Based Learning to Define Continuity*. MAA MathFest, Hartford, Connecticut.
- Boester, T. (2013, August). *Deconstructing the Formal Definition of Limit at a Point*. MAA MathFest, Hartford, Connecticut.
- Boester, T. & Talbert, A. (2012, November). *Teaching Absolute Value Through a Distance-Based Conception*. Paper presented at the 34th Annual Conference of the North American Chapter of the International Group for the Psychology of Mathematics Education. Kalamazoo, Michigan.
- Boester, T. (2012, August). *Recent Advances in Teaching and Learning the Formal Definition of Limit*. MAA MathFest, Madison, Wisconsin.
- Boester, T. (2011, February). *Designing and Implementing a Limit Diagnostic Tool*. Special Interest Group of the MAA, Fourteenth Conference on Research in Undergraduate Mathematics Education, Portland, Oregon.
- Boester, T. (2010, February). *Testing Conceptual Frameworks of Limit: A Classroom-Based Case Study*. Paper presented at the Special Interest Group of the MAA, Thirteenth Conference on Research in Undergraduate Mathematics Education, Raleigh, North Carolina.
- Ely, R. & Boester, T. (2010, February). *Point/Counterpoint: Should We Teach Calculus Using Infinitesimals?* Paper presented at the Special Interest Group of the MAA, Thirteenth Conference on Research in Undergraduate Mathematics Education, Raleigh, North Carolina.
- Boester, T. (2007, January). *A Classroom Study of Undergraduates' Understandings of Limits*. MAA Session on Research on the Teaching and Learning of Undergraduate Mathematics, AMS/MAA Joint Meetings, New Orleans, Louisiana.

### Departmental Honors Program (Math 448) Advising

Spring 2011 – Winter 2012: Anna Talbert, studying absolute value instruction in an eighth grade classroom. Three conference presentations resulted from this work: *Teaching absolute value through a distance-based conception*, presented at PME-NA 2012; *Teaching Absolute Value Inequalities Using the Idea of Distance*, presented at NCTM 2013 Regional Conference; *An Example of Using Action Research to Help a Pre-service Teacher Study Pedagogical Content Knowledge*, 2012 AMS Fall Central Sectional Meeting.

### Inquiry Project (ED 771 / ED 6490, MCE Licensure Program) Advising

Fall 2013 – Spring 2014: Brady Prater, Justin Gilmore, Emily Gilberg, AJ Schmitmeyer; investigating how problem solving can be supported through group work and guided frameworks.

Fall 2013 – Spring 2014: Colleen Demboski, Michelle Coale, Courtney Pennington, Ann Thompson; investigating written mathematical explanations and the norms of proof for middle school students.

Fall 2012 – Spring 2013: Amy Bange and Amanda Roddy; studied how opinions on calculator usage amongst local middle school mathematics teachers affects instructional choices.

Fall 2012 – Spring 2013: Caroline Scharrer, Courtney Scharrer, Zach Ward; investigated learning outcomes when using physical versus virtual manipulatives when studying fraction concepts.

Fall 2012 – Spring 2013: Alyssa Evers, Justin Wenning, Brian Schwieterman, Kim Marchal; conducted comparison study of graphic organizers with different content areas, focused on student preference.

Fall 2011 – Spring 2012: Claire Browne, Brandon Rogers, Kellie Harris, and Christopher Byrum; studied the alignment between assessment practices and classroom instruction in middle school math and science classrooms.

Fall 2011 – Spring 2012: Sarah Reiff and Ryan Bohardt; studied the effects of peer tutoring on learning and student attitudes in middle school math classrooms.

Winter 2011 – Fall 2011: Jacob Clark, Chad Miller, Adam Timmerman, and Thomas Collins; studied how using a guided framework will help students with mathematical problem solving.

Fall 2010 – Spring 2011: Molly Duffield, Jason Hale, Kevin Love, and Scott Goldberg; applied the ISLE method, created for college-level introductory physics courses, to middle school science course topics.

Fall 2010 – Spring 2011: Amy Woehrmyer, Jacquelyn Lehmkuhl, Justine Leichty, and Erica Drexler; studied how phonics activities in all four subject areas helped middle school students vocabulary retention.

Fall 2009 – Spring 2010: Katie Hippenmeyer, Amy Meyers, and Megan Rose; studied using alternative texts in middle school classrooms to increase student engagement.

Fall 2009 – Spring 2010: Ben Garrett, Mark Hibner, and Janel Meyer; studied how using role playing in middle school classrooms would impact student motivation.

Fall 2008 – Spring 2009: Erin Johnson, Diana Kiefer, and Kristan McLin; studied how aligning daily math review to current lesson content would affect assessment performance in middle school math classrooms.

Fall 2008 – Spring 2009: Ryan Steinbrunner, Bradley Bertke, and Jordan Pleiman; studied how phonics activities in all four subject areas helped middle school students vocabulary retention.

Fall 2008 – Spring 2009: Sarah Lange, Lisa Uhlenhake, Barry Peel, and Kyle Homan; studied how to implement writing activities in middle school math and science classrooms in order to monitor content comprehension.

## Teaching

### Teaching Experience

#### Assistant Professor, University of Maine

2018 – present

MAT 122 “Precalculus” (Academ-e Program): 2 “sections” (Fall 2020 - Spring 2021 x 5 schools, Fall 2019 – Spring 2020 x 3 schools)

MAT 122 “Precalculus” (Online): 4 section (Fall 2020, Summer 2020 x2, Summer 2019)

MAT 122 “Precalculus”: 8 sections (Fall 2020 x2, Spring 2020, Fall 2019, Summer 2019, Spring 2019 x2, Fall 2018)

MAT 110 “Concepts for Calculus”: 1 section (Summer 2020)

#### Clinical Assistant Professor, University of Illinois at Chicago

2016 – 2018

Math 110 “College Algebra”: 1 section (Fall 2017)

Math 180 “Calculus I”: 3 sections (Summer 2018, Summer 2017, Fall 2016)

Math 181 “Calculus II”: 1 section (Spring 2017)

MTHT 467 “Introduction to Number Theory with Application” (for pre-service middle school teachers): 1 section (Fall 2017)

MTHT 466 “Introduction to Calculus and the Graphing Calculator” (for pre-service middle school teachers): 1 section (Spring 2018)

MTHT 491 “Teaching Fellowship in Undergraduate Mathematics” (for undergraduate tutors and learning assistants): 2 sections (Spring 2018, Fall 2017)

#### Assistant Professor, Wright State University

2007 – 2014

Math 143 “Quantitative Reasoning” (for pre-service elementary teachers): 1 section (Summer 2008)

Math 243 “Fundamental Math Concepts I” (for pre-service elementary teachers): 6 sections (Fall 2011, Winter 2011, Fall 2009, Winter 2009, Fall 2008, Winter 2008)

Math 2410 “Mathematics Concepts for Teachers I” (for pre-service elementary teachers): 1 section (Fall 2013)

Math 2430 “Mathematics Concepts for Teachers II” (for pre-service elementary teachers): 2 sections (Spring 2014, Spring 2013)

Math 343 “Algebra and Function for Middle School Teachers”: 5 sections (Spring 2012, Winter 2012, Fall 2009, Spring 2008, Fall 2007)

Math 348 / Math 3480 “Concepts of Calculus for Middle School Teachers”: 13 sections (Spring 2013, Fall 2012, Spring 2012, Winter 2012, Spring 2011, Winter 2011, Spring 2010, Winter 2010, Spring 2009, Winter 2009, Summer 2008, Spring 2008, Winter 2008)

Math 446 / Math 4460 “Mathematical Modeling for Middle School Teachers”: 4 sections (Spring 2014, Spring 2011, Fall 2010, Spring 2009)

ED 2700 “Educational Psychology” (for pre-service teachers): 1 section (Fall 2012)

ED 411 “Early Childhood Mathematics: Philosophy, Curriculum and Materials”: 5 sections (Fall 2011, Fall 2010, Winter 2010, Fall 2008, Fall 2007)

ED 6350 “Middle Childhood Mathematics: Curriculum and Methods”: 2 sections (Fall 2013, Fall 2012)

ED 707, MTE 641 “Effective Mathematics Instruction for Grades 4 and 5”: 1 section (Summer 2010)

ED 771 / ED 6490 “Inquiry Project” (middle childhood graduate licensure program): 7 sections, 15 projects total (Spring 2014, Spring 2013, Spring 2012, Fall 2011, Spring 2011, Spring 2010, Spring 2009)

## Dr. Timothy C. Boester

ED 7830 "Advanced Educational Psychology" (for in-service and returning teachers seeking re-licensure or MA): 2 sections (Spring 2014, Spring 2013)

**Instructor, PEOPLE Program, University of Wisconsin-Madison** 2002 – 2007

C & I 630 "Teaching Math in Urban Classrooms" (professional development for in-service teachers), Milwaukee (High School) Program: 3 sections (Summer 2007, Summer 2006, Summer 2005)

"Beyond", Milwaukee (High School) Program: 1 section (Summer 2006)

"Geometry", Milwaukee (High School) Program: 4 sections (Summer 2005, Summer 2004, Summer 2003, Summer 2002)

"ACT Math Prep", Milwaukee (High School) Program: 2 sections (Summer 2004, Summer 2003)

"Geometry", Madison (Middle School) Program: 1 section (Summer 2003)

**Instructor/TA positions, University of Wisconsin-Madison** 1998 – 2006

Math 130 "Arithmetical Problem Solving" (for pre-service K-8 teachers, Instructor), Department of Mathematics: Spring 2006

Math 131 "Geometric Inference & Reasoning" (for pre-service K-8 teachers, Instructor), Department of Mathematics: Spring 2006

Math 132 "Mathematical Modeling" (for pre-service K-8 teachers, Instructor), Department of Mathematics: 3 sections (Fall 2005, Spring 2005, Fall 2004)

Ed Psych 796 "Cognition and Classroom Learning II" (graduate class, TA), Department of Educational Psychology: Spring 2004

Ed Psych 301 "Abilities and Learning" (TA), Department of Educational Psychology: Fall 2003

Math 171 "Calculus and Analytic Geometry" (TA), Department of Mathematics: Fall 1999

Math 221 / 222 "Calculus and Analytic Geometry" (TA), Wisconsin Emerging Scholars (WES) program discussion sections, Department of Mathematics: Fall 2002 – Spring 2003, Fall 2001 – Spring 2002

Math 221 / 222 "Calculus and Analytic Geometry" (TA), Department of Mathematics: Fall 1998 – Spring 1999

**Instructor/TA positions, High school enrichment courses, Center for Academic Advancement (Johns Hopkins University)** 1997 – 1999

"Reasoning" (Instructor) – Bethlehem, PA: Summer 1999

"Mathematics Workshop" (Instructor) – Bethlehem, PA: Summer 1998

"Mathematical Investigations" (TA) – Frederick, MD: Summer 1997

**TA positions, University of Chicago, Department of Mathematics** 1995 – 1998

Math 130/131/132 "Calculus" (TA): 3, three course sequences (Fall 1997 – Spring 1998, Fall 1996 – Spring 1997, Fall 1995 – Spring 1996)

## Service

### Professional Service

Co-organizer, Working Group on Infinity and Limits in Undergraduate Mathematical Learning, Research in Undergraduate Mathematics Education (Special Interest Group of the MAA).  
Conferences: February 2014, Denver, Colorado; February 2013, Denver, Colorado; February 2012, Portland, Oregon; February 2011, Portland, Oregon; February 2010, Raleigh, North Carolina.  
Nominating Committee member, Research in Undergraduate Mathematics Education (Special Interest Group of the MAA), 2012 – 2013.

### University Service

Maine Center for Research in STEM Education (RiSE Center) faculty member, 2018 – present.  
Wright State University, Center for Math and Science Education (CMSE) Steering Committee, elected 2008 – 2009.  
Wright State University, participated in NCATE review meetings in College of Education and Human Services, 2008.

### Departmental Service

University of Maine, Department of Mathematics and Statistics, PATFA Faculty evaluation, Spring 2019.  
University of Illinois at Chicago, Department of Mathematics, Statistics, and Computer Sciences, faculty advisor for math education seminar 2017 – 2018.  
University of Illinois at Chicago, Department of Mathematics, Statistics, and Computer Sciences, Student Awards Committee, appointed 2016 – 2018.  
University of Illinois at Chicago, Department of Mathematics, Statistics, and Computer Sciences, Mathematics Education Committee, appointed 2016 – 2018.  
University of Illinois at Chicago, Department of Mathematics, Statistics, and Computer Sciences, Pre-Calculus committee, appointed 2017 – 2018.  
Wright State University, Department of Mathematics and Statistics, Math Education Committee, appointed 2007 – 2014.  
Wright State University, Department of Teacher Education, Middle Childhood Program Committee, attending meetings 2008 – 2014.  
Wright State University, Department of Mathematics and Statistics, Colloquium Committee, appointed 2007 – 2011.  
Wright State University, Department of Mathematics and Statistics, Computing Committee, appointed 2011 – 2014.

### Outreach

Volunteer proctor and grader, Ohio Mathematics Contest, 2009 – 2013.