Curriculum Vitae

JOHNNA J. BOLYARD

Business Address:
West Virginia University
College of Education and Human Services
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EDUCATION

Ph.D. January 2006
Education, George Mason University, Fairfax, VA
Major: Mathematics Education Leadership
Minor: Instructional Technology
A Comparison of the Impact of Two Virtual Manipulatives on Student Achievement and Conceptual Understanding of Integer Addition and Subtraction

M.Ed. May 1998
Master of Education, Secondary Mathematics, West Virginia University.
Math credits – 30 hours
Virginia Postgraduate Professional License, Secondary Mathematics (2000)

B.A. May 1992
International Studies and History, West Virginia University.

EMPLOYMENT HISTORY

University Experience

Associate Professor, Mathematics Education (August 2013-present)
Associate Chair/Director (August 2019 – present)
College of Applied Human Sciences, School of Education, West Virginia University, Morgantown, West Virginia.
Responsibilities include teaching undergraduate and graduate courses in the Elementary Education program; designing, revising and implementing courses; and developing and implementing a professional agenda of teaching, citizenship, and scholarship within the university community.

Assistant Professor, Mathematics Education (2007-August 2013).
College of Education and Human Services, Department of Curriculum & Instruction/Literacy Studies, West Virginia University, Morgantown, West Virginia.
Responsibilities include teaching undergraduate and graduate courses in the Elementary Education program; designing, revising and implementing courses; and developing and implementing a professional agenda of teaching, citizenship, and scholarship within the university community.

Research Faculty, Mathematics Education Center (2005-2007).
College of Education and Human Development, Graduate School of Education, George Mason University, Fairfax, Virginia.
Post-doctoral research as Project Manager in the Mathematics Education Center on the *Math and Science Partnership Program Evaluation*, a $14.7 million dollar project funded by the National Science Foundation. Responsibilities include managing the budget for a $3.5 million dollar subcontract housed at George Mason University; collaborating with partner universities and research organizations, including COSMOS Corp., Brown and Vanderbilt Universities; assisting in hiring and supervising project staff, including an Administrative Assistant and four Graduate Research Assistants; collaborating with CEHD faculty to design research studies within the evaluation project; and publishing and presenting evaluation findings (Lead PI, R. Yin, and Co-PIs, P. Moyer-Packenham, K. Wong, and J. Scherer).

Adjunct Faculty (2004-2007).
College of Education and Human Development, Graduate School of Education, George Mason University, Fairfax, Virginia.
Responsibilities include designing, planning, and delivering course content, activities, and assignments; and assessing and evaluating student work. Courses taught include education, leadership, and mathematics content courses.

Research Assistant (2000-2003).
College of Education and Human Development, Graduate School of Education, George Mason University, Fairfax, Virginia.
Responsibilities included conducting library and Internet searches, transcribing interview tapes, coding qualitative data, and preparing presentation materials.

Public School Experience

K-12 Mathematics Specialist (2002-2005).
Loudoun County Public Schools, Loudoun County, Virginia.
Responsibilities included developing mathematics curriculum for the county; planning and conducting monthly meetings for mathematics contacts at the elementary, middle, and high school levels; designing and delivering professional development workshops for all grade level teachers in the county; and serving as a mentor and content coach for new teachers.

Lead Mathematics Teacher, *Farmwell Station Middle School*. (2001-2002).
Loudoun County Public Schools, Loudoun County, Virginia.
Responsibilities included attending county meetings for lead mathematics teachers and distributing information to building staff; managing mathematics resources for the building; and acting as building contact person for mathematics-related issues.

Mathematics Teacher, *Farmwell Station Middle School* (1998-2002).
Loudoun County Public Schools, Loudoun County, Virginia.
Taught Algebra and Geometry (including students in grades 6-8) integrating the use of technology such as virtual manipulatives, Geometer's Sketchpad, TI-83 graphing calculator, and spreadsheets.

RESEARCH

Research Interests:

- development of pre-service and in-service mathematics teachers and teacher leaders
- development of knowledge for mathematics teacher educators
- uses of representation and technology in mathematics

Publications

Books

Curtis, R., Cairns, D. R., & Bolyard, J. (2023). *Design thinking in the middle grades: Transforming mathematics and science learning*. NY: Teachers College.

Journal Articles (Refereed)

Bolyard, J., & Baker, C. (2023). Examining the practice of elementary mathematics specialists through narratives: Implications for professional learning and development. *Professional Development in Education, 49*(3), 565-579. Published online: 19 Jan 2021 https://10.1080/19415257.2021.1876150

Sealey, V., Infante, N., Campbell, M. P., & **Bolyard, J.** (2020). The generation and use of graphical examples in calculus classrooms: The case of the mean value theorem. *Journal of Mathematical Behavior, 57.* Available online: https://www.sciencedirect.com/science/article/pii/S0732312318302189

Valentine, K. D., & **Bolyard, J**. (2019). Lived Moments of Shift in Prospective Elementary Teachers' Mathematical Learning. *Journal for Research in Mathematics Education, 50*(4), 436-463.

Cairns, D. R., Curtis, R., Konstantinos, A. S., & **Bolyard, J.** (2018). Taking professional development from 2D to 3D: Design-based learning, 2D modeling, and 3D fabrication for authentic standards-aligned lesson plans. *Interdisciplinary Journal of Problem-Based Learning.* https://docs.lib.purdue.edu/ijpbl/vol12/iss2/8

Selmer, S. J., **Bolyard, J.,** & Bernstein, M. (2016). Multilayered knowledge: Understanding the structure and enactment of teacher educators' specialized knowledge base. *Teacher Development.* http://www.tandfonline.com/doi/abs/10.1080/13664530.2016.1173578?journalCode=rtde20

Moyer-Packenham, P. S., **Bolyard, J**., & Tucker, S. I. (2014). Second-graders' mathematical practices for solving fraction tasks. *Investigations in Mathematics Learning, 7*(1), 54-81.

Lynch, S., Lynch, J., & **Bolyard, J**. (2013). Informing practice: I-THINK I can problem solve. *Mathematics Teaching in the Middle School, 19*(1), 10-14.

Moyer-Packenham, P. S. Salkind, G., **Bolyard, J.**, & Suh, J. (2013). Effective choices and practices: Knowledgeable and experienced teachers' uses of manipulatives to teach mathematics, *Online Journal of Education Research, 2* (2). http://onlineresearchjournals.org/IJER/pdf/2013/apr/Moyer-Packenham%20et%20al..pdf

Bolyard, J., & Moyer-Packenham, P. S. (2012). Making sense of integer arithmetic: The effect of using virtual manipulatives on students' representational fluency. *Journal of Computers in Mathematics and Science Teaching, 31*, 93-113.

Lynch, S., & **Bolyard, J.** (2012). Putting mathematical discourse in writing. *Mathematics Teaching in the Middle School, 17,* 486-492.

Selmer, S.J., **Bolyard, J.,** & Rye, J. A. (2011). Statistical reasoning over lunch. *Mathematics Teaching in the Middle School, 17*, 274-281.

Moyer-Packenham, P. S., **Bolyard, J.** , Oh, H., & Irby, N. (2010). Common features of professional development activities for mathematics and science teachers. *Professional Development in Education, 37,* 571-589. 10.1080/19415257.2010.531597

Moyer-Packenham, P. S., Parker, J.. L., Kitsantas, A., **Bolyard, J.**, & Huie, F. (2009). Increasing the diversity of teachers in mathematics and science partnerships. *Journal of Educational Research & Policy Studies, 9*(2), 43-72. Retrieved from http://normes.uark.edu/erps/V9N2.pdf

Moyer-Packenham, P. S., Kitsantas, A., **Bolyard, J.**, Huie, F., & Irby, N. (2009*).* Participation by STEM Faculty in Mathematics and Science Partnership Activities for Teachers. *Journal of STEM Education, 10*(3 & 4), 1-20. Retrieved from http://ojs.jstem.org/index.php?journal=JSTEM&page=article&op=view&path[]=1455&path[]=1276

Bolyard, J., & Moyer-Packenham, P. S. (2008). A review of the literature on mathematics and science teacher quality. *Peabody Journal of Education, 83,* 509-535. 10.1080/01619560802414840

Moyer-Packenham, P. S., **Bolyard, J.**, Kitsantas, A., & Oh, H. (2008). The assessment of mathematics and science teacher quality. *Peabody Journal of Education, 83,* 562-591. doi: 10.1080/01619560802414940

Moyer, P. S., Salkind, G., & **Bolyard, J**. (2008). Virtual manipulatives used by K-8 teachers for mathematics instruction: Considering mathematical, cognitive, and pedagogical fidelity. *Contemporary Issues in Technology and Teacher Education, 8*(3). Retrieved from http://www.citejournal.org/vol8/iss3/mathematics/article1.cfm.

Moyer-Packenham, P. S., **Bolyard, J.,** Oh, H., Kridler, P., & Salkind, G. (2006). Representations of teacher quality, quantity, and diversity in a national mathematics and science program. *Journal of Educational Research & Policy Studies, 6(2),* 1-40.

Bolyard, J., & Moyer, P. S. (2004). Investigating Algebra with Virtual Manipulatives. *On-Math: Online Journal of School Mathematics, 2*(2).

Moyer, P. S., & **Bolyard, J.** (2003). Classify and capture: Using Venn diagrams and tangrams to develop mathematical reasoning and proof. *Mathematics Teaching in the Middle School, 8*, 325-330.

Moyer, P. S., & **Bolyard, J**. (2002). Exploring representation in the middle grades: Investigations in geometry with virtual manipulatives. *Australian Mathematics Teacher, 58*(1), 19-25.

Moyer, P. S., **Bolyard, J.**, & Spikell, M. A. (2002). What are virtual manipulatives? *Teaching Children Mathematics, 8*, 372-377.

Journal Articles (Invited)

Selmer, S., **Bolyard, J.**, & Rye, J. (2013). Statistical reasoning over lunch. Invited to republish year 2011 article from *Mathematics Teaching in the Middle School 17*(5), 274-281 in a lessons and activities format as part of Real World Math: Articles, Activities, Lesson Plans for the Middle Grades: https://www.nctm.org/publications/worlds/articles.aspx?id=39478 .

Moyer, P. S., **Bolyard, J., J**., & Spikell, M. A. (2002). Virtual manipulatives… Continuing the discussion. *Teaching Children Mathematics, 9*(3), 132-133, 162.

Journal Articles (Submitted)

Bolyard, J. & Baker, C. K. An Examination of How Content-Specific Leadership is Negotiated: District-level Mathematics Specialists' Sense-Making of Their Leadership Role. *Submitted September 2022 to Journal of School Leadership*.

Bolyard, J., Curtis, R., & Cairns, D. Learning to Struggle: Supporting Middle Grade Teachers' Understanding of Productive Struggle in STEM Teaching and Learning. Submitted May 2023 to *Canadian Journal of Science, Mathematics, and Technology Education*.

Book Chapters (Refereed and Invited)

Hayes, S. B. & **Bolyard, J.** (2018). Creating spaces for becoming: Interrogating the voices that arise in clinical practice. In D. Hoppey and D. Yendol-Hoppey (Ed.), *Outcomes of Clinically Rich Teacher Education*. Information Age Publishing: Advances in Teacher Education Series.

Moyer-Packenham, P. S., & **Bolyard, J.** (2016). Revisiting the definition of a virtual manipulative. In P. S. Mopyer-Packenham (Ed.) *International Perspectives on Teaching and Learning Mathematics with Virtual Manipulatives.* Springer.

Hoppey, D., Morewood, A., & **Bolyard, J.** (2010) Response to intervention: A framework for action research. In R. Pelton (Ed.) *Research in best practices in action research for teacher candidates*. Lanham, MD: Rowman & Littlefield.

Bolyard, J. (2010). Selecting virtual manipulatives for classroom use. In Patricia S. Moyer-Packenham (Ed.), *Investigating K-8 mathematics with virtual manipulatives, grades K-8* (pp. 12-29). Rowley, MA: Didax.

Moyer-Packenham, P. S., **Bolyard, J.**, Suh, J. M. (2010). Virtual manipulatives in classroom research. In Patricia S. Moyer-Packenham (Ed.), *Investigating K-8 mathematics with virtual manipulatives, grades K-8* (pp. 36-44). Rowley, MA: Didax.

Book Contract (accepted)

Design thinking in the middle grades: Transforming mathematics and science learning. R. Curtis, D. Carrins, & J. Bolyard. Teachers College Press.

Grants and Contracts Funded

Key personnel ($2,998,571). *Mountaineer Mathematics Master Teachers (M3T): Supporting Teacher Leadership and Networked Improvement of Mathematics Education in West Virginia.* National Science Foundation-Education and Human Resources. PIs- Matthew P. Campbell, Joanna Burt-Kinderman.

Co-Investigator ($111,337). *Teachers Engaged in STEM and Literacy* (2015-2018). West Virginia Department of Education, Math and Science Partnership Program. Project goal: Provide professional development for teachers in integrated STEM and literacy. Co-PIs – Reagan Curtis, Darran Cairns.

Co-Investigator ($221,605). *Project W.E.E.M.S: West Virginia Endorsement for Elementary Math Specialization* (2012-2015). West Virginia Department of Education, Math and Science Partnership Program. Project goal: provide courses and experiences leading to an elementary mathematics specialist endorsement. PI: Edgar Fuller; Co-PIs – Vicki Sealey, Jessica Deshler, and Nicole Infante.

Principal Investigator/Consultant ($18,600). *Skyview Elementary School Improvement Grant*. (2010). Monongalia County Schools Office of Federal Programs, Title I Program. Project goal: Provide professional development in teaching mathematics for understanding for K-5 teachers, administrators, and pre-service teachers at Skyview Elementary School, Morgantown, WV.

Co-Investigator ($748,334). *Teaching Excellence at College for High Achievement in West Virginia (TEACH-WV).* (2008-2013). National Science Foundation, Robert Noyce Scholarship Program. PI – Jennifer Jackson; Co-PIs – Jeffrey Carver, David Miller, Michelle Withers.

Project Evaluator. *21st Century Statistics* (2007-2008). Improving Teacher Quality State Grants Program (Title II), West Virginia. Project goal: to increase the content knowledge, technology skills, and instructional strategies of secondary and pre-service teachers in the area of statistics. Co-PIs – Margorie Darrah and Laura Pyzdrowski.

Co-Investigator ($95,203). *MATH BRIDGES II Project* (2003-2004). Improving Quality State Grants Program, Virginia. Project goal: Provide professional development in the use of concrete and virtual manipulatives that increases the mathematics achievement of students for 80 K-8 teachers in the Loudoun County Public School System.

Lead Instructor – Grades 7-8 ($65,347). *MATH BRIDGES Project: Concepts and Connections in the K8 Standards.* (2002-2003). Dwight D. Eisenhower Professional Development Program, Virginia. Project goal: Provide professional development in the use of concrete and virtual manipulatives for 60 K-8 teachers in the Loudoun County Public School system that increases the mathematics achievement of students (with Patricia Moyer-Packenham, Denise Frye, and Jennifer Suh).

UNIVERSITY TEACHING

Associate Professor (August 2013-present); Assistant Professor (August 2007-August 2013). College of Education and Human Services, Curriculum & Instruction/Literacy Studies, West Virginia University, Morgantown, West Virginia.
Planned and developed course content, planned and delivered content, activities, and assignments, and assessed and evaluated student work.

Courses taught:

C&1 431: Mathematics Methods for Elementary Teachers (1). This course introduces students to methods for teaching all children in developmentally appropriate topics in elementary mathematics. Emphasis is placed on current movements in mathematics education, the big ideas of elementary mathematics, teaching for understanding, and understanding children's mathematical thinking. Students engage in examining and analyzing children's mathematical thinking and work, examining and analyzing standards documents, and analyzing curricular materials. Students enrolled in C&I 431 are concurrently enrolled in EDUC 410: Practicum III, which coordinates their field placements. Two hours per week of the required time in the field are dedicated to C&I 431

C&I 497: Research. The purpose of this course is to encourage critical reflection and inquiry among prospective teachers as they learn about our educational system, about teaching, and about research, and as they come to understand that we learn to teach through studying teaching. Critical reflection is rooted within a deliberative, democratic stance that honors and respects the voices of children/students and families in dialogue with teachers who are situated within unique communities that have the potential to shape and be shaped by place-conscious, critical inquiry. Inquiry enables exploration of underlying personal assumptions, biases, values, and ideologies, as well as those that are inherent in curricula, pedagogies, policies and practices of the contexts in which we are situated. Students demonstrate their curiosity about teaching and learning through designing and conducting intentional, systematic narrative inquires that privilege the voices and points of view of the learners and teachers in their contexts and, when possible, the families of their learners as well as other community members.

C&1 693: Teacher Cognition. This course examines research on teacher cognition, with particular attention to the knowledge teachers bring to their work. We will discuss the key components of knowledge for teaching, how that knowledge is organized and accessed, and the relationship between teachers' knowledge and their instructional practices. We will also investigate teacher learning, that is, how teachers *develop* the knowledge needed for teaching.

C&I 230: Mathematics for Elementary Teachers (1). The focus of this course is on topics at the heart of mathematics in the primary grades (preK-3) and how those concepts and skills connect to mathematics on the horizon (middle grades and beyond). The focus is whole numbers and includes topics in the domains of counting and cardinality, numbers and operations in base ten, algebraic thinking, measurement, and geometry and the connections among topics in these domains; students will also explore how various structures and concepts extend to other sets, including integers and rational numbers.

C&I 231: Mathematics for Elementary Teachers (2). The focus of this course is on topics at the heart of mathematics in the intermediate grades (3-6) and how those concepts and skills connect to mathematics on the horizon (middle grades and beyond). Study extends beyond whole numbers to include rational numbers. The focus is on topics in the domains of numbers and operations in base ten, numbers and operations-fractions, algebraic thinking, measurement, and geometry and the connections among topics in these domains.

EDUC 430: Mathematics Methods for Elementary Teachers. Course designed to introduce students to methods for teaching all children in developmentally appropriate topics in numbers and operations, algebra, data analysis and probability, measurement and statistics, and geometry. Students work with manipulatives and technologies to explore mathematics,

solve problems, and learn ways to teach mathematics content to children. Emphasis is placed on the current reform movements in mathematics education.

C & I 630: Problem Solving in Standards-Based Mathematics. Course for master's level students in Elementary Education. Focuses on mathematical inquiry, problem solving, reasoning, and communicating. Students will develop and reflect on their own mathematical understanding in a problem-based learning environment while exploring connections to the use of problem-based learning in the elementary mathematics classroom.

C&I 631: Mathematics Methods for Elementary Teachers. Masters level course designed to introduce students to methods for teaching all children in developmentally appropriate topics in numbers and operations, algebra, data analysis and probability, measurement and statistics, and geometry. Students work with manipulatives and technologies to explore mathematics, solve problems, and learn ways to teach mathematics content to children. Emphasis is placed on the current reform movements in mathematics education.

C&I 426: Rational Numbers and Proportional Reasoning for Elementary and Middle School Teachers. Course designed to deepen students' knowledge of mathematics for teaching rational numbers and proportional reasoning concepts. Instruction examines interpretations, computations, and estimation with fractions, ratios, proportions, decimals, and percents through a coordinated program of activities that develop rational number concepts and skills. Students engage in interpreting and assessing elementary and middle school students' work and learning.

C&I 738: Survey: Major Issues in Mathematics Education. Doctoral level seminar course designed to expose graduate students to current directions in research in mathematics education.

Adjunct Faculty (2004-2007).
College of Education and Human Development, Graduate School of Education, George Mason University, Fairfax, Virginia.
Planned and developed course content, planned and delivered content, activities, and assignments, and assessed and evaluated student work. Courses taught include education, leadership, and mathematics content courses.

Courses taught:

EDCI 646: Math Education Leadership for School Change. Yearlong seminar for master's level students in the Mathematics Education Leadership cohort program. Surveys current literature and large-scale studies in mathematics education. Engages students in research, study, and discussion of factors that impact teaching and learning of mathematics in school settings.

Math 600: Rational Numbers and Proportional Reasoning (Summer 2006, 2007). Content course for master's students interested in becoming future K-8 mathematics teacher specialists. Instruction examines interpretations, computations, and estimation with fractions, ratios, proportions, decimals, and percents through a coordinated program of activities that develop rational number concepts and skills. Students engage in interpreting and assessing students' work and learning.

EDCI 633: Advanced Mathematics Methods for the Elementary Classroom (Fall 2005). Focuses on teaching all children problem solving and higher order thinking skills based on

state and national mathematics standards. A variety of techniques and materials are used to promote better understanding of various mathematical concepts. Students read, interpret, and critique mathematics education research and examine its applications in classrooms.

EDCI 646: Math Education Leadership for School Change (Fall 2004 and Summer 2005). Seminar in mathematics education leadership for school change for the Pakistan Teacher Education and Professional Development Project cohort. Surveys current literature issues in mathematics education and school change. Engages students in discussion of and reflection on factors that impact the process of school change in the area of mathematics education. Students examine their own roles as mathematics education leaders and how they can act as agents of school change.

Co-Instructor (2004).
College of Education and Human Development, Graduate School of Education, George Mason University, Fairfax, Virginia.
Served as a co-instructor for EDCI 663: Advanced Mathematics Methods, a course for in-service, K-8 teachers. Worked with the lead instructor to plan and develop of course content, plan and deliver content, activities, and assignments for class sessions, and assess and evaluate student work.

SERVICE

Presentations

National and International

Research Presentations
The Entangled Nature of Tensions: Appalachian Elementary Pre-service Teachers' Problematization of Equity in Mathematics Education [Paper Session]. 2021 AERA Annual Meeting. Virtual Conference. Valentine, K. D., & Bolyard, J.

Focusing on Place in Appalachia: Supporting Elementary Pre-Service Teachers'Development of a Critical Equity Lens [Paper Session]. 2021 Annual Association of Mathematics Teacher Educators (AMTE) Conference. Virtual Conference. Bolyard, J., & Valentine, K. D.

Supporting Elementary Preservice Teachers to Critically Examine Equity in Rural Appalachia [Roundtable Session]. AERA Annual Meeting San Francisco, CA http://tinyurl.com/vygqwsg (Conference Canceled). Bolyard, J., Valentine, K. D. & Freeland, S. P. (2020, Apr 17 - 21)

Investigating a Design Framework to Support Pre-Service Teachers' Perspectives Regarding Access, Equity, and Productive Struggle. Paper presented at the 2019 Annual Meeting of the American Educational Research Association, Toronto, Canada (April, 2019). With Keri Valentine and Sean Freeland.

The Lives of Elementary Math Specialists: Interrogating Sacred Stories, Developing Identities. Paper presented at the 2019 Annual Meeting of the American Educational Research Association, Toronto, Canada (April, 2019). With Sharon Hayes.

Examining the Work of Mathematics Teacher Leaders/Specialists through Agency, Agenda, and Positioning. Paper presented at the 2019 Annual Meeting of the American Educational Research Association, Toronto, Canada (April, 2019). With Courtney Baker.

Creating a Classroom Culture that Supports Productive Struggle: Pre-service Teachers' Reflections on Teaching Mathematics. Paper presented at the 2018 Annual Meeting of the American Educational Research Association, New York, NY. (April, 2018). With Keri Valentine.

"Shoes of Students…Shoes of Teachers": Experiencing and Understanding Productive Struggle. Paper presented at the 2018 Annual Meeting of the American Educational Research Association, New York, NY. (April, 2018). With Reagan Curtis, Darran Cairns, and Angela Walker.

Improving Teacher Mathematical Content Knowledge with Integrative and Sustained Engineering Design Support. Paper presented at the 2018 Annual Meeting of the American Educational Research Association, New York, NY. (April, 2018). With Reagan Curtis, Darran Cairns, and Angela Walker.

Collaborative Phenomenological Writing: Using van Manen's Anecdotes to Explicate Preservice Teachers' Shifts Towards Mathematics. Paper presented at the Thirteenth International Congress of Qualitative Inquiry, Champaign-Urbana, IL (May, 2017). With Keri Valentine.

Mathematical Learning Experiences: Leveraging Elementary Pre-service Teachers' Existing Perspectives to Support New Understandings. Paper presented at the 2017 Annual Meeting of the American Educational Research Association, San Antonio, TX. (April, 2017). With Keri Valentine.

Teachers Engaged in STEM and Literacy (TESAL): Engineering Design for Middle School Teaching and Learning. Paper presented at the 2017 Annual Meeting of the American Educational Research Association, San Antonio, TX. (April, 2017). With Reagan Curtis, Darran Cairns, David Loomis, Sera Mathew, and Kelly Watts.

Teachers as Learners: A Model to Build Teacher Content Knowledge through Engineering Design. Paper presented at the 2017 Annual Meeting of the American Educational Research Association, San Antonio, TX. (April, 2017). Poster session. With Reagan Curtis, Darran Cairns, David Loomis, Sera Mathew, and Kelly Watts.

The Good, Bad, and Complex: Understanding and Leveraging Elementary Preservice Teachers' Mathematics Experiences. Brief research report presented at the 2017 Association of Mathematics Teacher Educators Annual Conference, Orlando, FL. (January, 2017). With Keri Valentine.

Learning to teach through studying teaching: The influence of contexts, communities, and discourse. Paper presented at the 2016 Annual Meeting of the American Educational Research Association, Washington, DC. (April, 2016). With Sharon Hayes.

Learning With and From Each Other: Professional Learning Communities as Spaces for Studying our Teaching. Paper presented at the 2014 Annual Meeting of the American Educational Research Association, Philadelphia, PA. (April, 2014). With Sharon Hayes, Sarah Selmer, and Ugur Kale.

What do prospective teachers notice about teachers and students? Learning to teach from studying teaching. Paper presented at the 2013 Annual Meeting of the American Educational Research Association, San Francisco, CA. (April, 2013). With Sharon Hayes and Sarah Selmer.

Multilayered PCK: Working Towards a Model of Teacher Educator Knowledge. Paper presented at the 2013 Annual Meeting of the American Educational Research Association, San Francisco, CA. (April, 2013). With Malayna Bernstein, and Sarah Selmer.

Articulating a Model of Teacher Educators' Knowledge. Paper presented at the 2012 Annual Meeting of the American Educational Research Association, Vancouver, BC, Canada. (April, 2012). With Malayna Bernstein, and Sarah Selmer.

Creating Spaces for Interrogating and Transforming Practice and Identity: Learning About Practice in Practice. Paper presented at the 2012 Annual Meeting of the American Educational Research Association, Vancouver, BC, Canada. (April, 2012). With Sharon Hayes and Sararose Lynch.

Virtual Technology Enhanced Attainable Mathematics (V-TEAM): An Integrated Mathematics Lesson Study Project. Poster presented at the 2012 Annual Meeting of the American Educational Research Association, Vancouver, BC, Canada. (April, 2012). With Pam Whitehouse, Ugur Kale, Malayna Bernstein, and Sarah Selmer.

Preservice Teacher Education: The What *and* How *of Connecting to Course Text.* (November 2009). Research presentation at the Association of Literacy Educators and Researchers Conference, Charlotte, NC. With Aimee Morewood.

Participation by STEM Faculty in Mathematics and Science Partnership (MSP) Activities for Teachers. (April 2009). Paper presented at the American Educational Research Association's Annual Meeting, San Diego, CA. With Patricia Moyer-Packenham (lead), Anastasia Kitsantas, Faye Huie, and Nancy Irby.

Examining Strategies that Promote Teacher Diversity in Mathematics and Science. (May 2008). Paper presentation, International Consortium for Research in Science and Mathematics Education (ICSRME) XII, Quito, Ecuador. With Patricia Moyer-Packenham and Jana Parker.

Representations of Teacher Quality, Quantity, and Diversity in the MSP Program. (April, 2007). Paper presentation AERA 2007 Annual Meeting. With Patricia S. Moyer-Packenham, Hana Oh, Trish Kridler, and Gwenanne Salkind.

Pakistan and Pedagogy: A critical reflection of process and outcomes of a donor-funded teacher education project for Pakistani teacher educators. Part I: U.S.-based Training. (April, 2007). Paper presentation AERA 2007 Annual Meeting. With Sherry L. Steeley, Michael Dalton, and George Flowers.

The Impact of Virtual Manipulatives on Students' Learning of Integer Concepts. (2006, March). Research Paper Presentation, International Consortium for Research in Science and Mathematics Education XI (ICRSME), Nassau, Bahamas. With Patricia Moyer-Packenham.

Refereed Conference Proceedings

Curtis, R., **Bolyard, J**., Cairns, D**.,** Loomis, D. L., Mathew, S., & Watts, K. L. (2017). Building middle school teacher mathematics and science content knowledge through engineering design. *Proceedings of the American Society for Engineering Education's (ASEE) 124th Annual Conference & Exposition.*

Curtis, R., **Bolyard, J**., Cairns, D**.,** Loomis, D. L., Mathew, S., & Watts, K. L. (2017). Middle school math and science teachers engaged in STEM and literacy through engineering design. *Proceedings of the American Society for Engineering Education's (ASEE) 124th Annual Conference & Exposition.*

Curtis, R., Cairns, D**.,** **Bolyard, J**., Loomis, D. L., Watts, K. L., Mathew, S., & Carte, M. T. (2016). Integrating STEM and literacy through engineering design: Evaluation of professional development for middle school math and science teachers. *Proceedings of the American Society for Engineering Education's (ASEE) 123rd Annual Conference & Exposition.*

Hayes, S. B., **Bolyard, J**., Finkel, M., Gulick, E., & Schrand, C. Learning in and from Practice: Creating Spaces to Problematize and Address the Inequities in Curriculum, Pedagogies, and Classrooms. *Proceedings of the 2015 National Association of Professional Development Schools Conference.*

Hayes, S. B., **Bolyard, J.**, Chevlin, J., Cupini, E., Donathan, E., Hathaway, A., Little, S. & Wilson, J. Creating Spaces for Inquiry: What/How Prospective Teachers and Teacher Educators Learned With and From Each Other. *Proceedings of the 2014 National Association of Professional Development Schools Conference.*
http://www.ed.sc.edu/pds/docs/2014/14PDS%20Proceedings%20and%20TOC.pdf

Bolyard, J., Cumberledge, K. Connecting Mathematics Practice, Content, Theory, and Pedagogy in a Professional Development Partnership. *Proceedings of the 2012 National Association of Professional Development Schools Conference*.
http://www.ed.sc.edu/pds/docs/PDS12_Proceedings_with_TOC.pdf

Hayes, S., Smith, J., Allison, M., & **Bolyard, J**. Innovative teaching, antiquated assessment: Problematizing the quality of classroom assessments used as evidence in teacher inquiry. *Proceedings of the 2012 Professional Development Schools National Conference.*
http://www.ed.sc.edu/pds/docs/PDS12_Proceedings_with_TOC.pdf

Smith, J., **Bolyard, J.**, Hayes, S., Steel S., & Oonge, H. *Staying in the family: Studying program graduates now teaching in PDS. Proceedings of the 2012 Professional Development Schools National Conference.* http://www.ed.sc.edu/pds/docs/PDS12_Proceedings_with_TOC.pdf

Bolyard, J., Hoppey, D., & Morewood, A. Leveraging Response to Intervention Initiatives to Effectively Meet The Professional Development Needs of All PDS Partners. *Proceedings of the 2011 Professional Development Schools National Conference*.
http://www.ed.sc.edu/pds/docs/PDS11_Proceedings.pdf

Bolyard, J., Hoppey, D., Morewood, A., Hefner, M., & Scanlon, A. (2010). The influence of collaborative efforts to implement response to intervention on teacher preparation. *Proceedings of the 2010 National Association of Professional Development Schools*.
http://www.ed.sc.edu/pds/docs/PDS10_Proceedings.pdf

Hoppy, D., **Bolyard, J.**, & Morewood, A. (2009). Response to intervention: An opportunity to share knowledge and build bridges between PDS partners. *Proceedings of the 2009 National Association of Professional Development Schools Conference*. http://www.ed.sc.edu/pds/docs/PDS09_Proceedings.pdf

Moyer-Packenham, P. S., Salkind, G., & **Bolyard, J**. (2007). Teachers' uses of virtual manipulatives in K-8 mathematics lessons. In T. Lamberg (Ed.), *Proceedings of the Twenty-Ninth Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education.*

Bolyard, J., & Moyer-Packenham, P. S. (2006). The impact of virtual manipulatives on student achievement in integer addition and subtraction. In S. Alvatorre (Ed.), *Proceedings of the Twenty-Eighth Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education.*

Moyer-Packenham, P. S., **Bolyard, J.**, Oh, H. Kridler, P., & Salkind, G. (2006). Representations of mathematics teacher quality in a national program. In S. Alvatorre (Ed.), *Proceedings of the Twenty-Eighth Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education.*

Salvo, L. C., Smith, L., Inge, V., Staley, J., Bolyard, J. , & Moyer, P. S. (2002). Rabbit ears to slope derivatives: Longitudinal development of an algebraic concept. In A. Rogerson (Ed.). *Proceedings of the International Conference on the Humanistic Renaissance in Mathematics Education* (pp. 334-338). Casio & Autograph.

Moyer, P. S., **Bolyard, J.**, & Spikell, M. A. (2001). Virtual manipulatives in the K-12 classroom. In A. Rogerson (Ed.). *Proceedings of the International Conference New Ideas in Mathematics Education* (p. 184-187). Autograph.

Session Presentations

Integrated STEM Initiatives: Issues, Challenges, and Opportunities for Mathematics Teacher Education. Discussion Session at the 2016 Association of Mathematics Teaches Educators Annual Conference (January, 2016). With Matthew Campbell, Sarah Selmer, and Keri Valentine.

The Contexts in Which We Learn to Teach: How Do They Influence Our Questions, Our Practices, Our Identities? Presentation at the 2015 Association of Teacher Educators (ATE) Annual Conference (February, 2015). With Sharon Hayes.

Mathematics Specialists: A New Role in Schools. Working group at the Psychology of Mathematics Education – North America Chapter 2013 Conference (November, 2013). With Margret Hjalmarson, Pamela Bailey, Patricia Moyer-Packenham, Jennifer Suh, and Joy Whitenack.

Understanding the Common Core through a PDS Partnership: Leveraging University, PDS, and District Level Expertise. Presentation at the 2013 National Professional Development Schools Conference (February, 2013). With Becca Porter and Kristie Cumberledge.

Learning to Teach from Studying Teaching. Presentation at the 2013 Association of Mathematics Teacher Educators Annual Conference, Orlando, FL. (January, 2013). With Sarah Selmer.

Preparing Elementary Preservice Teachers to Teach the CCSSM Standards of Mathematical Practice. Presentation at the 2013 Association of Mathematics Teacher Educators Annual Conference, Orlando, FL. (January, 2013). With Sarah Selmer.

How Does Your Pattern Grow? Fostering Students' Algebraic Reasoning. Presentation at the 2012 Annual Meeting of the National Council of Teachers of Mathematics (April, 2012). With Sarah Selmer.

Making the Mathematics Classroom Come Alive through Garden-based Learning. Presentation at the 2012 Annual Meeting of the National Council of Teachers of Mathematics (April, 2012). With Sarah Selmer and Jim Rye.

Mathematical Pen Pals: How the Discursive Practices of Pre-Service Teachers and Middle School Students Affect Their Learning and Identities. Presentation at the 92nd Annual Conference of the Association of Teacher Educators, San Antonio, TX. (February, 2012). With Sharon Hayes.

Comparing Elementary Preservice Teacher Problem Solving Activities in Traditional Versus Distance Course Formats. Presentation at the 2012 Association of Mathematics Teacher Educators Annual Conference, Fort-Worth, TX. (February, 2012). With Amy Brown and Sarah Selmer.

Developing Preservice Middle School Mathematics Teachers' Pedagogical Content Knowledge in the Area of Algebraic Reasoning. Presentation at the 2012 Association of Mathematics Teacher Educators Annual Conference, Fort-Worth, TX. (February, 2012). With Sarah Selmer.

An Emerging Framework for Two Mathematics Educators Building Knowledge of Practice. Presentation at the Association of Mathematics Teacher Educators Annual Meeting (2011), Irvine, CA. With Sarah Selmer.

Problem Solving Pen-pals: A Partnership between Pre-service teachers and Kindergarten through Grade Six Students to Improve Problem Solving, Presentation at the Association of Mathematics Teacher Educators Annual Meeting (2011), Irvine, CA. With Sararose Lynch.

Recruiting Teachers in West Virginia: More Opportunities and Challenges, to the Robert Noyce Teacher Scholarship Program Annual Conference Building Excellence in STEM Teaching, Washington, DC, July 7-9, 2010, J. Kasi Jackson (presenting author), Johnna Bolyard, James Rye, Jeffrey Carver, Michelle Withers, Paul Miller, David Miller, Michelle Richards-Babb, Jennifer Stueckle, & Jennifer Robertson-Honecker.

Virtual or Not? Selecting Virtual Manipulatives for Effective Classroom Use. Presentation at the National Council of Teachers of Mathematics Annual Meeting and Exposition (2010), San Diego, CA. With Patricia Moyer-Packenham.

You Are What You Eat: Integrating Science and Mathematics. Presentation at the National Council of Teachers of Mathematics Annual Meeting and Exposition (2010), San Diego, CA. With Sarah Selmer and Jim Rye.

Issues and Challenges for Supporting Noyce Scholars in Rural High Need Schools. (July 2009). Presentation at the NSF Robert Noyce Teacher Scholarship Program Conference, Washington, DC. With Kasi Jackson.

TEACH WV: An NSF Robert C. Noyce Funded Project to Increase Science and Mathematics Teachers in High Needs West Virginia School Districts. (March 2009). Presentation at the NCSCE Washington Symposium and SENCER Capitol Hill Poster Session, Washington, DC. With Kasi Jackson and Jim Rye (lead presenters), Jeffrey Carver, Michelle Withers, David Miller, Michelle Richards-Babb, Jane Caldwell, and Jennifer Robertson Honecker.

Selecting Dynamic Technology Representations for Mathematics Teaching. (March 2007). Presentation, NCTM 2007 Annual Meeting and Exposition, Atlanta, Georgia.

Lesson Study Course (August 2006 – April 2007). Course presenter for grades 6-8, National Council of Teachers of Mathematics, Reston, Virginia.

Lesson Study Pilot Course (August 2005 – April 2006). Course presenter, National Council of Teachers of Mathematics, Reston, Virginia.

Exploring Algebra with Virtual Manipulatives, (2004, April). Workshop, 82nd Annual Meeting of the National Council of Teachers of Mathematics, Philadelphia, Pennsylvania.

Exploring Representation Using Virtual Manipulatives in Geometry. (2003, April). Paper Presentation, 81st Annual Meeting of the National Council of Teachers of Mathematics, San Antonio, Texas. With Patricia Moyer-Packenham.

Manipulatives and Technology: A Concrete View of Algebraic Representations. (2003, April). Workshop, 81st Annual Meeting of the National Council of Teachers of Mathematics, San Antonio, Texas. With John Staley.

Using Concrete and Virtual Manipulatives to Promote Problem-Solving Skills. (2001, March). Workshop, 79th Annual Meeting of the National Council of Teachers of Mathematics, Orlando, Florida.

Regional and Local

Response to Intervention: Mathematics. Blackshere Elementary School. (2010, March).

Developing Critical Thinking and Logical Reasoning. Suncrest Primary School. (2010, March).

The Use of Stations in Mathematics Instruction. Rivesville Elementary and Middle School. (2010, January).

Mathematical Knowledge for Elementary Teachers. Invited Presentation at the West Virginia Mathematical Association of Two-Year Colleges (WVMATYC) Annual Meeting (2009, April).

21st Century Approaches to Multi-Digit Computation. Presentation for the West Virginia Council of Teachers of Mathematics (WVCTM) Annual Conference (2009, March). With Sarah Selmer.

Student Detectives: Integrating Math & Science through Inquiry Learning (2004, December). Workshop, National Science Teachers Association Eastern Regional Conference, Richmond, Virginia. With Jennifer Chang.

Manipulating Success in Algebra 1: Using Virtual Manipulatives and Computer Technologies to Facilitate Algebraic Representations, (2004, November). Workshop, National Council of Teachers of Mathematics Southern Regional Conference, New Orleans, Louisiana. With John Staley.

Student Detectives: Integrating Math & Science through Inquiry Learning. (2003, November). Workshop, National Council of Teachers Southern Regional Conference, Charleston, South Carolina.

Awards

Outstanding Teaching Award (2021).
College of Human Resources and Education, West Virginia University
Award received in recognition of achievements in teaching at West Virginia University. Teaching activities include courses taught in the Bachelor's in Elementary Education and PhD in Educational Theory and Practice programs..

Mathematics Teacher of the Year- College Level (2015).
West Virginia Council of Teachers of Mathematics.
Award received in recognition of achievements in teaching at the college level.

Outstanding Teaching Award (2010).
College of Human Resources and Education, West Virginia University
Award received in recognition of achievements in teaching at West Virginia University. Teaching activities include courses taught in the Five Year Teacher Education Program and Master's with Certification Program.

PhD Service Award, *Graduate School of Education* (2006).
College of Education and Human Development, George Mason University
Award received in recognition of service provided to the PhD program in the Graduate School of Education. Service activities include teaching courses in two Master's programs in GSE, representing George Mason University on statewide mathematics education committees, attending Mathematics Education Leadership and Mathematics and Science Education Leadership program meetings, and serving as a member of a faculty search committee.

Consultations

Committee Member. (2021). National Council on Teacher Quality Math Expert Advisory Panel.

Elementary Math Specialization Guidance Document Creation Committee, *West Virginia Department of Education* (2011-2012). Participate in creating standards and guidance document for programs certifying elementary mathematics specialists in the state of West Virginia.

Virginia Mathematics Advisory Board, *Glencoe/McGraw-Hill* (2004).
Served as content consultant and reviewer Virginia-specific supplements to textbooks.

Reviewer, USA TODAY Education and National Standards Project. Identified national mathematics standards and wrote suggested activities for USA TODAY daily lesson plans.

Technology Instructor, *M²ATH FACTS Project: Mathematics Manipulatives and Technology for Fairfax County Middle School Special Education Teachers.* (2001). Dwight D. Eisenhower Professional Development Program, Virginia.

Co-instructor. *Much Math in a Minimum of Morsels.* (2000). George Mason University, Fairfax, Virginia. Week-long summer camp for 14 students grades 4-8.

Professional Service

Committee Member. Professional Development Committee of the Association of Mathematics Teacher Educators. (2019-2021).

Reviewer. (2018). *Interdisciplinary Journal of Problem-Based Learning.* Reviewed manuscript for special issue.

Reviewer. (2016). *Journal of Mathematical Behavior.* Reviewed manuscripts for special issue on Mathematics Coaches.

Reviewer. (2014; 2016; 2018; 2021). National Science Foundation. Reviewed grant proposals.

Reviewer. (2013-2017; 2019). *American Educational Research Association.* Review proposal submissions for the Annual Conference program.

Reviewer. (2010 – 2018). *Mathematics Teaching in the Middle School*. Refereed journal published by the National Council of Teachers of Mathematics.

Reviewer. (2009 – present). *Association of Mathematics Teacher Educators.* Review proposal submissions for the Annual Conference program.

Professional Development School Liaison. (2017-present). Served as a university liaison for an elementary school in WVU's professional development school network (North Elementary).

Professional Development School Liaison. (2009-2016). Served as a university liaison for an elementary school in WVU's professional development school network (Skyview Elementary).

Professional Development School Liaison. (2008-2009). Served as a university liaison for two elementary schools in WVU's professional development network (Mason-Dixon Elementary and Mylan Park Elementary).

Virginia Mathematics Specialist Course Committee. (2006). Reviewed and revised objectives and content of current courses offered for the Virginia Mathematics Specialist endorsement.

Virginia Standards of Learning Assessments Content Review Committee – Eighth-Grade Mathematics. (2004). Reviewed potential items for inclusion in the field test item bank; reviewed statistics on responses to field test items for inclusion in the test item bank. Richmond, Virginia.

International Mathematical Olympiad Invigilator. (2001). George Mason University, Fairfax, Virginia.

School Textbook Adoption Committee Representative. (1999-2000). Loudoun County, Virginia.

Curriculum Writing Committee Member. (1999, June). Aligned Loudoun County Public School's 8th grade mathematics curriculum with Virginia's Standards of Learning. Leesburg, Virginia.

Professional Association Memberships

American Educational Research Association (AERA)
- Presenter (2007, 2009, 2012; 2013; 2014; 2016; 2017; 2018)
- Proposal reviewer (2013-2022)

Association of Mathematics Teacher Educators (AMTE)
- Member, Professional Development Committee (2020-2023)
- Presenter (2011-2017, 2020-present)
- Proposal reviewer (2009-Present)

Association of Teacher Educators (ATE)
- Presenter (2012)

National Association of Professional Development Schools (NAPDS)
- Presenter (2009, 2010, 2011, 2012, 2013, 2014, 2015)

National Council of Teachers of Mathematics (NCTM)
- Presenter (2001, 2003, 2004, 2007, 2010, 2012)

North American Chapter of the International Group for the Psychology of Mathematics Education (PMENA)
- Presenter (2006, 2007)
- Proposal Reviewer (2008, 2009)

West Virginia Council of Teachers of Mathematics (WVCTM)
- Presenter (2009)