Jennifer M. Suh

Curriculum Vitae

University address:
George Mason University
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http://cehd.gmu.edu/people/faculty/jsuh/

EDUCATION

PH.D. in Education, May 2005
Specialization in Mathematics Education Leadership
George Mason University, Fairfax, Virginia

Suh, Jennifer M. (2005) *Third Graders' Mathematics Achievement and Representation Preference Using Virtual and Physical Manipulatives for Adding Fractions and Balancing Equations.* Dissertation chair: Dr. Patricia Moyer-Packenham

Master of Teaching in Elementary Education, May 1994
University of Virginia, Charlottesville, Virginia

Bachelor of Art in Psychology, May 1994
Five Year Education Program, Certification K-8
University of Virginia, Charlottesville, Virginia

TEACHING

UNIVERSITY TEACHING EXPERIENCES

Assistant Professor, Mathematics Education (Fall 2006- Present)
George Mason University, Fairfax, Virginia

Member of Mathematics Education faculty
Member of Elementary Education faculty

Responsibilities include teaching graduate courses in Elementary Education Programs and Mathematics Education Leadership, assisting in the development and implementation of programs for students, advising students within the program, and supervising graduate students in field placements for the professional development schools. Currently, I am the dissertation chair for four doctoral students.

Courses taught:

EDCI 552 – Mathematics Methods for the Elementary Classroom
An introduction to methods for teaching all children developmentally appropriate topics in number and operations, geometry, algebra, and data analysis. Students work with manipulatives and technologies to explore mathematics, solve problems, and learn ways to teach mathematics content to children.

EDCI 666- Research in Mathematics Education
Research seminar for Master's level students in the Mathematics Specialists Leader Program and Mathematics /Science Education Leadership cohort program. Students survey the most current research literature in mathematics education and engage in research, study, and discussion of teaching and learning mathematics in school settings.

EDCI 645 Mathematics Learning and Assessment in K-8
Focuses on mathematics curricular standards and processes and a variety strategies for assessing student understanding in mathematics.

EDCI 633 -Advanced Mathematics Methods for the Elementary Classroom
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 609 -Problem Solving in Mathematics
Focuses on the learning processes fundamental to the development of mathematical thinking. Examines a variety of instructional strategies and materials related to the broad scope of mathematical content.

EDCI 790 - Internship in Education
Graduate interns are supervised in a Professional Development School placement setting that includes observations and seminar experiences.

EDCI 680-Teaching Mathematics for Diverse Populations
Mathematics specialists focus on characteristics of students with diverse learning and cultural needs and how to teach mathematics content using a variety of instructional materials, assessment tools, strategies, and techniques for teaching mathematics. Emphasis on supporting the power and complexity of students' mathematical thinking.

MATH 600-Algebraic Connections and Technology in the Middle Grades
The course provides opportunities for the growth of middle grades mathematics teachers understanding of algebra as a study of patterns, symbolic language, a tool for problem solving, a study of functions, as it relates to proportional reasoning, generalized arithmetic, and as a way of modeling physical situations.

University Supervisor. (2004-Present).
Elementary Education Program, George Mason University, Fairfax Virginia.
Supervised preservice elementary teachers during their student teaching internship at Westlawn Elementary, Fall Church, Virginia

Super-Adjunct Professor (Fall 2004-Spring 2006)
George Mason University, Fairfax, Virginia

Adjunct Professor (2003-2004)
Marymount University Arlington, Virginia
ED 548 Mathematics and Technology PK-3 & 4-6
This course was designed to help interns develop an understanding of how children develop mathematics and technology knowledge and skills, and how mathematics and technology are interrelated; to develop appropriate attitudes towards the teaching of these disciplines; and to develop instructional strategies needed to become effective teachers of the inquiry curriculum in grades PK-6.

PUBLIC SCHOOL TEACHING EXPERIENCES (10 years)

Third - Fifth Grade Mathematics Teacher, Little River Elementary School, Loudoun, Virginia
Gifted Education Teacher, Willow Springs Elementary School, Fairfax, Virginia
Multiage Elementary Teacher, Lemon Road Elementary School, Falls Church, Virginia
Korean Immersion Elementary Teacher, Seoul American Elementary School, Seoul, Korea

RESEARCH

PUBLICATIONS

Research Interests

- *Developing mathematics pedagogical content knowledge and confidence in teachers;*
- *Investigating socio-cultural practices that improve mathematics teaching and learning;*
- *Developing representational fluency through mathematics tools and emerging technologies in the classroom.*

Journal Articles (Refereed)

Suh, J. M., Johnston, C., Mills, M., & Jamieson, S. (2008). Promoting decimal number sense and representational fluency. *Mathematics Teaching in the Middle School, 14*(1), 44-50.

Suh, J. M., Johnston, C. & Doud, J. (2008). Enhancing mathematics learning in a technology rich environment. *Teaching Children Mathematics, 15*(4), 235-241

Hjalmarson, M. & Suh, J. M. * (2008). Developing mathematical pedagogical knowledge by evaluating instructional materials. *Inquiry into Mathematics Teacher Education. AMTE Monograph V.*
(joint authorship/lead* Contributions of the first two authors to this article were equal.

Suh, J. M. & Jamieson, S. (2008). Collaborative mentoring: Establishing a mathematics teaching & learning community through Lesson Study. *NCTM's Empowering Mentors of Mathematics*, NCTM.

Suh, J. M. (2007). Developing "Algebra -'rithmetic" in the elementary grades. *Teaching Children Mathematics, 14*(4), 246- 250.

Suh, J. M. (2007). Tying it all together: Building mathematics proficiency for all students. *Teaching Children Mathematics, 14*(3), 163-169.

Scaptura, C., Suh, J. M., & McHaffey, G. (2007). Masterpieces to mathematics: Using art to teach fraction, decimal, and percent equivalents. *Mathematics Teaching in the Middle School, 13*(1), 24-28.

Suh, J. M., & Moyer-Packenham, P. S. (2007). Developing students' representational fluency using virtual and physical algebra balances. *Journal of Computers in Mathematics and Science Teaching.* 26 (2), 155-173.

Suh, J. M., Moyer, P.S., & Heo, H. J. (2005). Examining technology uses in the classroom: students developing fraction sense by using virtual manipulative concept tutorials, *Journal of Interactive Online Learning, 3*(4), 1-22.

Heo, H. J., Suh, J. M., & Moyer, P. S. (2004). Impacting student confidence: The effects of using virtual ma nipulatives and increasing fraction understanding. *The Journal of Educational Research in Mathematics, 14*(2), 207-219.

Suh, J. M., Moyer, P. S. & Sterling, D. (2003) Junior Architect: Designing your dream clubhouse using measurement and geometry, *Teaching Children Mathematics, 10*(3), 170-179.

Conference Proceedings (Refereed)

Suh, J. M., & Fulginiti, K. (2009). Building collective knowledge using pedagogical content tools and problem solving. *Proceedings of the International Group for the Psychology of Mathematics Education.*

Suh, J. M. & Moyer, P. S. (2008). Scaffolding Special Needs Students' Learning of Fraction Equivalence Using Virtual Manipulatives. *Proceedings of the International Group for the Psychology of Mathematics Education* (pp. 4-297-304). ISSN# 0771-100X

Suh, J. M. & Moyer, P. S. (2007). The Application of Dual Coding Theory in Multi-Representational Virtual Mathematics Environments. *Proceedings of the International Group for the Psychology of Mathematics Education.* Vol 4, pp. 209-216. Seoul: PME.

Suh, J. M. (2007) Preparing teachers to model mathematics with tech-knowledgy. *Proceedings of the North American Chapter of Psychology of Mathematics Education*.

Suh, J. M., Moyer, P. S., & Heo, H. J.(2005). Technology uses in the mathematics classroom: Understanding fractions using virtual manipulatives concept tutorials. *Proceedings of the 3rd Annual Hawaii International Conference on Education* (pp. 4479-4499). ISSN# 1541-5880.

Lynch, M. C., Moyer, P. S., Suh, J. M., & Frye, D. (2002). Web-based learning: Telecollaboration models to enhance mathematics instruction. In A Rogerson (Ed.). *Proceedings of the International Conference on the Humanistic Renaissance in Mathematics Education* (pp.279-282). Casio & Autograph.

Curriculum Publications

Math 411: Young Mathematicians on Call (In Progress).
Developed mathematics problem solving modules to promote algebraic connections in middle grades mathematics Grades 4-6

Math Bridges: K-8 On-line resources for technology and mathematics (2007)
http://mason.gmu.edu/~jsuh4/mathbridges/index.html

Illumination Lesson Plans (2005)
Developed geometry and measurement lessons for NCTM's Illumination website.

Gifted Readers' Resource Guide (Summer 2000)
Curriculum development for FCPS Gifted and Talented Program
Developed a resource guide for Gifted and talented 3-4 grade using the themes of Change, Creativity, Perspectives and Interdependence.

Our Club House (Summer 2000)
Curriculum development for FCPS Gifted math program
Enrichment for primary students using real life problem solving.

PROFESSIONAL PRESENTATIONS AND WORKSHOPS

INTERNATIONAL PRESENTATIONS

Building collective knowledge using pedagogical content tools and problem solving
International Conference on Psychology of Mathematics Education (Research report)
Thessaloniki, Greece July 17-21, 2009
Shared design research with Classroom teacher in building collective knowledge through mathematics discourse

Scaffolding Special Needs Students' Learning of Fraction Equivalence Using Virtual Manipulatives
International Conference on Psychology of Mathematics Education (Research report)
Morelia, Mexico July 17-21, 2008.
Discussed strategies for enhancing mathematics instruction for students with special needs using virtual manipulatives. Results indicated that affordances in the virtual manipulative applets enabled special needs learners to "off-load" information and focus more on mathematical processes and relationships among equivalent fractions.

The Application of Dual Coding Theory in Multi-Representational Virtual Mathematics Environments
International Conference on Psychology of Mathematics Education (Research report)
Seoul, Korea, July 8-13, 2007
Examined the application of Dual Coding Theory (DCT) in multi-representational virtual mathematics environments focusing on the nature of learners' algorithmic thinking processes when exploring mathematical tasks with dynamic electronic objects, or virtual manipulatives.

Building Mathematical Knowledge For Teaching Using Tech-Knowledgy
International Conference on Psychology of Mathematics Education (Poster presentation)
Seoul, Korea, July 8-13, 2007
Explored pre-service teachers' experiences with planning and teaching with technology and its impact on their mathematical knowledge for teaching, confidence and attitude about teaching mathematics.

Third Graders' Achievement and Representation Preference Using Virtual and Physical Manipulatives in Adding Fractions and Balancing Equations in Algebra
International Consortium for Research in science and Mathematics Education
Nassau, Bahamas, March 9-11, 2006
Presented dissertation findings that compared virtual and physical manipulatives in teaching fractions and algebra concepts to third graders.

Technology Uses in the Mathematics Classroom: Understanding Fractions Using Virtual Manipulatives Concept Tutorials
Hawaii International Conference on Education, January 4-7, 2005.
Presented research findings that revealed unique characteristics of the fraction manipulatives that enhanced understanding for fraction equivalence and addition in third graders.

NATIONAL PRESENTATIONS

Developing Collective Teacher Efficacy in a Professional Development School,
American Educational Research Association
San Diego, California. April 2009
Discuss four major themes that emerged from *Developing Collective Teacher Efficacy in a Professional Development School*: T.I.M.E. for excellence: T-teacher leadership, I- instructional improvements, M-mentoring through mastery experiences and modeling, and E-empowerment.

Let's Talk Math: Engaging All Learners in Meaningful Mathematical Discourse
National Council of Teachers of Mathematics
Washington, DC. April 2009
Share classroom practices that engage all learners (Special Needs, gifted, ELL, and Ethnically and SES diverse students) in meaningful math discourse that encourage justifying, reasoning, and proving through multiple methods of engagement, representations, expressions and assessments.

Preparing Pre-service Teachers to Teach Mathematics with Tech-knowledgy
North American Chapter of Psychology of Mathematics Education
Lake Tahoe, Nevada. October 2008
Discussed the learning experiences designed to develop pre-service teachers' confidence and competence in teaching with technology in mathematics classrooms.

I Can Solve It! Developing Persistent Flexible Problem Solvers
National Council of Teachers of Mathematics: Salt Lake City, UTAH, APRIL 2008
Teachers who participated in NCTM's Lesson Study present lessons and teaching strategies that develop persistence and flexibility

Teachers Building Mathematics Knowledge Side by- Side through Collaborative Planning
Association of Mathematics Teacher Educators: Tulsa, Oklahoma, January 2008

Presented a project involving preservice and inservice teachers working collaboratively on planning, teaching and reflecting on mathematics lessons.

Modeling and Investigating Mathematics Concepts Using Interactive Math Applets and Virtual Manipulatives in Elementary Grades
National Educational Computing Conference ISTE. Atlanta, Georgia, June 22-25, 2007
Explored issues surrounding integrating technology into mathematics, with a focus on modeling mathematics concepts and designing investigations using virtual manipulatives and applets. The experiences of 22 pre-service teachers during a semester long mathematics methods course are shared through analysis of surveys, reflection based on designing a lesson using these tools, class discussion and teacher interviews.

Third Graders' Mathematics Achievement Using Virtual and Physical Manipulatives for Adding Fractions and Balancing Equations
AERA Poster presentation, Chicago, Illinois. April 9-12, 2007.
Presented dissertation findings that compared virtual and physical manipulatives in teaching fractions and algebra concepts to third graders.

Modeling Mathematics Concepts Meaningfully Using Technology
Association of Mathematics Teacher Educators: Irvine, California. January 26, 2007.
Presented data gathered from the learning experiences of 22 preservice teachers who explored mathematical concepts and models using technology and showcased ways pre-service teachers incorporated virtual manipulatives in their lessons.

Introduction to Lesson Study
National Council for Teachers of Mathematics Workshop - August 2-5, 2006
This course, offered during the 2006-2007 academic year, allowed a group of teachers the chance to learn and practice a Japanese lesson study approach to mathematics instruction while earning 3 graduate credits.

Implementing the Algebra Standard in Grades 3–5
National Council of Teachers of Mathematics e-workshops
January & February 2006: 90-minute E-Workshops offering approaches and techniques for integrating algebraic concepts in the classroom.

Junior Architect: Design your clubhouse using Measurement and Geometry
NCTM Conference: San Antonio, Texas. April 2003.
Our Clubhouse Project is a project based learning activity, which explores geometry, measurement and fraction concepts through problem solving and the use of manipulatives. Students take the role of junior architects as they solve a variety of math problems related to real life architecture, construction, and budgeting while designing and building a clubhouse.

STATE AND REGIONAL PRESENTATIONS & WORKSHOPS

Building Collective Mathematical Knowledge through Pedagogical Content Tools
Fairfax County Public Schools Academic Institute, (January 27, 2009)
Presented instructional strategies that promoted collective mathematical knowledge in a problem-based classroom

Developing Teachers Algebraic Connections
College of Education and Human Development Research Symposium, George Mason University, (February 11, 2009)
Present on research findings from the ACT NOW: Algebraic Connections and Technology Summer institute and Lesson Study Project

Establishing Lesson Study at your school: Lesson Study Workshop
Lesson Study Consultant for Tibury Schools, Massachusetts. (Spring 2007).
Provided professional development for teachers in establishing a Lesson Study community.

Westlawn Elementary Lesson Study Professional Development School
Consultant for Professional Development for Lesson Study for Westlawn Elementary, Fairfax County Virginia (Fall 2007 and Spring 2008).
Provided professional development for teachers in establishing a Lesson Study community.

Algebracadabra: Demystifying Algebraic Reasoning for Elementary Grades
National Council of Teachers of Mathematics Regional Conference:
Atlantic City, New Jersey. October 20-22, 2006.
Shared strategies with elementary teachers to reconceptualize the meaning of algebra so that it can be integrated into the curriculum.

Developing Mathematical Profiency for All Students
Professional Development Workshop for Loudoun County Public School - August 2004
Presented a three hour workshop for 120 teachers from grades 3-5 to promote math proficiency in all students.

Living in a 2 D& 3D World
VCTM Conference: Richmond, Virginia. (March 2003)
Presentation about plane and solid geometry using virtual and concrete manipulatives

SOL Concept Bridges
Virginia Council of Mathematics: Manassas, VA. (March 16, 2002)
Presentation about teaching VA. Math SOL using physical and virtual manipulatives

Math Bridges: Connecting Concepts using Physical and Virtual Manipulatives
Loudoun County Inservice Day (March 11, 2002)
Presentation about using physical and virtual manipulatives to bridge conceptual and procedural knowledge.

Our Club House: Using Project Based Math
Virginia Council of Teachers of Mathematics : Harrisonburg, Va.(March 9, 2001)
Presentation about using a project based approach to teach geometry and measurement.

RESEARCH SUPERVISION

PHD Chair

- Chris Johnston
- Wendy Shudmak
- Gwenanne Salkind
- Jana Parker

PhD Committee member

Faye Obenschain- Mathematics Educational Leadership

GRANT PROJECTS

Grants Funded
Principal Investigator: "IMPACT Improving Mathematical Practices through Algebraic Connections and Technology for the Middle Grades"
State Council of Higher Education for Virginia, $ 168,000
This grant will be used to fund a 2009-2010 NCLB project as a continuation of ACT now from 2008-2009 with five districts in Virginia.

Principal Investigator: "ACT now: Algebraic Connections and Technology for the Middle Grades"
State Council of Higher Education for Virginia, $ 73,000
This grant will be used to fund a 2008-2009 NCLB project entitled, "Algebraic Connections and Technology in Middle Grade Mathematics." The project consists of two phases. The first phase was completed in August, 2008.

Forty-one Fairfax County public school teachers participated in an 8-day institute which focused on making algebraic connections at all levels of elementary and middle school mathematics, with an emphasis on integrating technology. The second phase will occur during the Fall, 2008 semester, during which the teachers will engage in lesson study in their respective schools. In addition to these two phases of the project, teachers will earn 3 graduate-level credits at GMU, and they will attend the National Council of Teachers of Mathematics (NCTM) Annual Meeting in Washington, D.C. in April, 2009 to disseminate their learning.

Mathematical Potential of Diverse Learners through Algebraic Reasoning
National Council of Teachers of Mathematics & *Mathematics Education Trust Grant: Classroom research grant 2008-2009 (*$8,000)
Principal Investigator of Classroom Research K-6 with Kerri Fulginiti, 4th grade teacher
Classroom research grant for a summer institute to develop mathematics problem solving skills with mathematical promising students from diverse populations.

Developing Students' Algebraic Reasoning through Problem Solving and Technology
National Council of Teachers of Mathematics & *MET Grant:*
Classroom-based Research Grant 2009-2010 ($8,000)
Principal Investigator of Classroom Research K-6 with EL Haynes School, DC Charter School
The purpose of this grant project is to explore the development of students' algebraic reasoning using problem driven lessons and appropriate technology in the elementary classrooms. Through collaboration with a mathematics educator, the teachers at EL Haynes will co-design research lessons that focus on rigorous mathematics in authentic problems that use technology targeting low-performing student populations.

Grants- Lead Instructor

MATH BRIDGES II Project: Concepts and Connections in the K-8 Standards (2003-2004). Lead instructor for Grades 3-4 teachers. No Child Left Behind Grant. Project goal: Provide professional development in the use of concrete and virtual manipulatives for 80 K-8 teachers in the Loudoun County Public School System that increases the mathematics achievement of students.

MATH BRIDGES I Project: Concepts and Connections in the K-8 Standards ($65,347). (2002-2003). Lead instructor for Grades 3-4 teachers. 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.

Grant Submitted

Improving Teacher Instruction for Middle School Students with Disabilities: Mathematics Professional Development Modules on Universal Design for Learning (CFDA 84.324A).
INSTITUTE OF EDUCATION SCIENCES: Goal 2 Development grant on Teacher Quality (*Co-project investigator: Jennifer Suh with Peggy King-Sears and Pam Baker*) *3 year grant for $*1.5 million
The purpose for this grant is to improve Teacher Quality through the effective use of Professional Development for Universal Design for Learning by optimizing the promise of improved classroom mathematical practices for middle school students with mild disabilities.

IMPACT: Instructional Modules for Promoting Algebraic Connections and Technology through Authentic Problems (CFDA 84.305A: Education Research)
INSTITUTE OF EDUCATION SCIENCES*: Mathematics and Science Education Goal 2 – Development (Principle Investigator: Jennifer Suh & Co-investigator: Padhu Seshaiyer) 3 year grant for $*1,487,121
The purpose of IMPACT is to develop engaging instructional modules that promote problems-based learning, algebraic connections and the use of technology to foster mathematical potential of diverse learners. The instructional modules will be text/web-based to provide maximum access to students and teachers, use dynamic, interactive technologies, increase classroom participation and motivation and develop mathematical processes such as communication, proof and reasoning, representations and connections.

AWARDS

Graduate School of Education Ph. D. Award Spring 2005.
College of Education and Human Development, George Mason University

Fairfax County Public Schools Teacher of the Year & Washington Post's Agnes Meyer Award Nominee-
Nominated for 2000-2001 school year.

SERVICE ACTIVITIES

INTERNATIONAL LEADERSHIP AND SERVICE
NATIONAL LEADERSHIP AND SERVICE

Illumination Advisory Group and Braining Camp Project for the National Council of Teachers of Mathematics (March, 2008-on going). Served as a member of an advisory group for the research and development of NCTM's Illumination Project and Braining Camp Project.

Reviewer for the International Group for Psychology of Mathematics Education (IGPME) (2007-present)
Reviewed submitted conference research reports and gave feedback for acceptance/rejection.

Reviewer for National Council of Teachers of Mathematics journal, Teaching Children Mathematics (2006-present). Review submitted journal articles on a regular basis.

Reviewer for Association of Mathematics Teacher Educator's journal TE-MAT (2006-present). Teacher Education Materials Project provides descriptions of professional development materials for mathematics teachers.

Instructor for National Council of Teachers of Mathematics Lesson Study Course (Summer 2006 &2007)

Content Expert Reviewer (2007). Technology Intergration in the Content Areas. Thomson Publishing.

STATE LEADERSHIP AND SERVICE

University facilitator (2004-present). *Professional Development School Partnership*. Spend one day each week at Westlawn Elementary School and Colin Powell Elementary School, Fairfax Count Public Schools, Virginia.

OUTREACH FOR SCHOOLS

Building Collective Mathematical Knowledge through Pedagogical Content Tools
Fairfax County Public Schools Academic Institute, (January 27, 2009)
Presented instructional strategies that promoted collective mathematical knowledge in a problem-based classroom

Consultant for Professional Development for Lesson Study for DC Charter School. E.L. Haynes (Spring 2008). Provided long term professional development for teachers in establishing a Lesson Study community.

Consultant and Instructor for Teacher Leadership Grant. Westlawn Elementary, Falls Church, Virginia (Summers 2006, 2007 & 2008).
Collaborated (in kind) on a grant for Developing Teacher Leadership for Summer Institutes. Planned and taught professional development workshop for a three week summer institute for Westlawn Elementary School in Falls Church, Virginia

Instructor for Westlawn Labschool MATH 411: Falls Church, Virginia (Summer 2008).
Taught problem solving in mathematics (in context of their own community) to rising 4-6th grade students from a Title One Elementary School.

Lead Instructor (3-4). MATH BRIDGES II Project: Concepts and Connections in the K-8 Standards. (2003-2004).

Two week course with four follow-up classes
No Child Left Behind Grant. Professional Development Program, Virginia
Project goal: Provide professional development in the use of concrete and virtual manipulatives for 80 K-8 teachers in the Loudoun County Public School System.

Lead Instructor (3-4). MATH BRIDGES Project: Concepts and Connections in the K-8 Standards. (2002-2003). Two week course with four follow-up classes
Dwight D. Eisenhower Professional Development Program, Virginia ($65,347). 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.

MEMBERSHIP IN PROFESSIONAL SOCIETIES

- American Educational Research Association
- Association for the Psychology of Mathematics Education, North American Chapter and International member
- National Council for Teachers of Mathematics
- Association for Supervision and Curriculum Development
- Association for Mathematics Teacher Educators