

## CURRICULUM VITAE

**Margret A. Hjalmarson**

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### CONTACT INFORMATION:

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### ACADEMIC PREPARATION:

Purdue University	2000-2004	Ph.D. Mathematics Education
Dissertation: Designing presentation tools: A window into teacher practice.		
Purdue University	1998-2000	M.S. Mathematics
Mount Holyoke College	1996-1998	B.A. Mathematics
Graduated cum laude with honors		
Cottey College	1994-1996	A.A. Liberal Arts

### PROFESSIONAL EXPERIENCE:

#### **Assistant Professor**, August 2004-Present

College of Education & Human Development, George Mason University

- Program Coordinator, Mathematics Education (2008-present)
- Director, Mathematics Education Center (2008-present)
- Member of Mathematics Education faculty
- Member of Secondary Education faculty
- Member of Mathematics Education Leadership Program

#### **Post-Doctoral Researcher**, February 2004 – July 2004

NSF-funded Small Group Mathematical Modeling Project for Improved Gender Equity in Engineering, Department of Engineering Education, Purdue University

- Developed curriculum and conducted research on mathematics foundational to small group, real-world, problem-solving activities

#### **Graduate Research Assistant**, 2001 – 2003

NSF-funded Small Group Mathematical Modeling Project for Improved Gender Equity in Engineering, School of Education, Purdue University

- Collaborated with engineering and education faculty on large-scale, NSF-funded gender-equity initiative
- Head of interdisciplinary task design group including graduate students and faculty in engineering and education

- Designed and evaluated curriculum materials for freshman engineering course in mathematical technological tools.

### **Visiting Fellow, Spring-Summer 2003**

Queensland University of Technology, Brisbane, Australia

### **Graduate Research Assistant, 2000 - 2003**

Twenty-first Century Conceptual Tools Center, Purdue University

- Organized mathematics teacher development activities
- Coordinated teacher development activities for Fall Creek Valley Middle School, Indianapolis
- Engaged in the implementation and development of curriculum materials

### **Curriculum and Instruction Graduate Teaching Assistant, 2000 – 2002**

Department of Curriculum and Instruction, Purdue University

- EDCI 364: Mathematics Teaching Methods for Elementary School (Fall '01, Spring '02)
- EDCI 498: Supervision of Secondary Mathematics (Spring '01)
- EDCI 564: Integration and Management of Computers in Education (Fall '00)
- EDCI 590: Teaching Middle School Mathematics (Fall '00)

### **Mathematics Graduate Teaching Assistant, 1998 - 2000**

Department of Mathematics, Purdue University

- MATH 151: Algebra and Trigonometry (Summer '00)
- MATH 152: College Algebra for Liberal Arts (Fall '99)
- MATH 161E: Plane Analytic Geometry and Calculus I (Fall '98)
- MATH 261: Multivariate Calculus (Spring '99, Summer '99)

## **RESEARCH AND SCHOLARSHIP:**

### **Journal Articles:**

- Hjalmarson, M. (2008). Mathematics Curriculum Systems: Models for Analysis of Curricular Innovation and Development, *Peabody Journal for Education*, 83(4), 592-610.
- Hjalmarson, M. & Diefes-Dux, H. (2008). Teacher as designer: A framework for teacher analysis of mathematical model-eliciting activities. *Interdisciplinary Journal of Problem-based Learning*, 2(1), 57-78.
- Hjalmarson, M. (2007). Engineering students designing a statistical procedure. *Journal of Mathematical Behavior*, 26(2), 178-188.
- Diefes-Dux, H. A., Hjalmarson, M., Bowman, K., & Zawojewski, J. S. (2006). Quantifying aluminum crystal size part 1: The model-eliciting activity. *Journal of STEM Education*, 7(1&2), 51-63.
- Hjalmarson, M. A., Diefes-Dux, H. A., Bowman, K., & Zawojewski, J. S. (2006). Quantifying aluminum crystal size part 2: The model-development sequence. *Journal of STEM Education*, 7(1&2), 64-73.

Lesh, R., Doerr, H. M., Carmona, G., & Hjalmarson, M. (2003). Beyond constructivism. *Mathematical Thinking and Learning*, 5(2,3), 211-234.

### **Monographs:**

Hjalmarson, M. & Suh, J. (in press). Developing Mathematical Pedagogical Knowledge by Evaluating Instructional Materials. In F. Arbaugh & M. Taylor (Eds.), *AMTE Monograph V: Inquiry into Mathematics Teacher Education*.

### **Book Chapters:**

Diefes-Dux, H. Hjalmarson, M. A., Miller, T., & Lesh, R. (2008). Model-eliciting activities for engineering education. In J. S. Zawojewski, H. Diefes-Dux, & K. Bowman (Eds.), *Models and modeling in engineering education: Designing experiences for all students* (p. 17-36). Rotterdam, The Netherlands: SensePublishers.

Hjalmarson, M. A. (2008). Learning from students' responses to MEAs. In J. S. Zawojewski, H. Diefes-Dux, & K. Bowman (Eds.), *Models and modeling in engineering education: Designing experiences for all students* (p. 173-186). Rotterdam, The Netherlands: SensePublishers.

Hjalmarson, M. A., Diefes-Dux, H., & Moore, T. J. (2008). Designing model development sequences for engineering. In J. S. Zawojewski, H. Diefes-Dux, & K. Bowman (Eds.), *Models and modeling in engineering education: Designing experiences for all students* (p. 37-54). Rotterdam, The Netherlands: SensePublishers.

Hjalmarson, M. & Lesh, R. (2008a). Engineering and design research: Intersections for education research and design. In A. E. Kelly, R. Lesh & J. Baek (Eds.), *Handbook of design research in education: Innovations in science, technology, engineering and mathematics learning and teaching*. New York: Routledge.

Hjalmarson, M. & Lesh, R. (2008b). Engineering, systems, products, and processes for innovation. In L. English (Ed.), *Handbook of international research in mathematics education 2<sup>nd</sup> Ed.* New York: Routledge.

Wood, T., Hjalmarson, M. A., Williams, G. (2008). Learning to design in small group mathematical modeling. In J. S. Zawojewski, H. Diefes-Dux, & K. Bowman (Eds.), *Models and modeling in engineering education: Designing experiences for all students* (p. 187-212). Rotterdam, The Netherlands: SensePublishers.

Zawojewski, J. S., Hjalmarson, M. A., Bowman, K. J. & Lesh, R. (2008). A modeling perspective on learning and teaching in engineering education. In J. S. Zawojewski, H. Diefes-Dux, & K. Bowman (Eds.), *Models and modeling in engineering education: Designing experiences for all students* (p. 1-16). Rotterdam, The Netherlands: SensePublishers.

Zawojewski, J. S., Chamberlin, M., Hjalmarson, M. A., & Lewis, C. (2008). Designing design studies for professional development in mathematics education: Studying teachers' interpretive systems. In A. E. Kelly, R. Lesh, & J. Baek (Eds.), *Handbook of design research in education: Innovations in science, technology, engineering and mathematics learning and teaching*. New York: Routledge.

- Hjalmarson, M., Cardella, M., & Adams, M. (2007). The role of iterative cycles in engineering problem solving. In R. Lesh, E. Hamilton & J. Kaput (Eds.), *Foundations for the future in mathematics education* (pp.409-430). Mahwah, NJ: Lawrence Erlbaum.
- Martin, F. G., Hjalmarson, M. A., & Wankat, P. C. (2007). When the model is a program. In R. Lesh, E. Hamilton & J. Kaput (Eds.), *Foundations for the future in mathematics education* (pp. 395-408). Mahwah, NJ: Lawrence Erlbaum.
- Lesh, R., Lester, F. K., & Hjalmarson, M. (2003). A models and modeling perspective on metacognitive functioning in everyday situations where mathematical constructs need to be developed. In R. A. Lesh & H. M. Doerr (Eds.), *Beyond constructivism: Models & modeling perspectives on mathematics problem solving, learning & teaching* (pp. 383-404). Hillsdale, NJ: Lawrence Erlbaum Associates.

### **Book Reviews:**

- Hjalmarson, M. A. (2007). The learning of mathematics: Sixty-ninth yearbook. *Mathematics Teacher*, 101(5), 397.

### **Refereed Proceedings:**

- Buck, J. R., Wage, K. E., Hjalmarson, M. A., & Nelson, J. K. (2007). Comparing student understanding of signals and systems using a concept inventory, a traditional exam and interviews. Paper presented at the Frontiers in Education Conference. Milwaukee, WI.
- Hjalmarson, M. (2006, November). The role of challenging mathematics content: Teacher content courses in MSP. Proceedings of twenty-eighth annual meeting of the Association for the Psychology of Mathematics Education – North American Chapter. Merida, Mexico.
- Wage, K. W., Buck, J. R., & Hjalmarson, M. A. (2006, September). Analyzing misconceptions using the signals and systems concept inventory and student interviews. Proceedings of the IEEE Twelfth Digital Signal Processing Workshop and Fourth IEEE Signal Processing Education Workshop. Teton National Park, WY.
- Hjalmarson, M. (2005, October). Purposes for Mathematics Curriculum: Pre-service Teachers' Perspectives. Proceedings of twenty-seventh annual meeting of the Association for the Psychology of Mathematics Education – North American Chapter. Roanoke, VA.
- Hjalmarson, M. A. (2003, July). Designing a discussion: Teacher as designer. Proceedings of the twenty-sixth annual meeting of the Mathematics Education Research Group of Australasia. Geelong, Australia.
- Hjalmarson, M. A. (2002, October). Technology and middle school student response to model-eliciting activities: A case study. Proceedings of twenty-fourth annual meeting of the Association for the Psychology of Mathematics Education – North American Chapter. Athens, GA.

Hjalmarson, M. A. (2001, October). A modeling perspective on metacognition in everyday problem-solving situations. Proceedings of twenty-third annual meeting of the Association for the Psychology of Mathematics Education – North American Chapter. Snowbird, UT.

### **Presentations:**

- Baek, J., Hjalmarson, M., & Bannan-Ritland, B. (2008). Design Research on a Diet: A Methodological Framework Called Design Assessment. Paper presented at the American Educational Research Association. New York, NY.
- Hjalmarson, M., Buck, J. R., & Wage, K.A. (2008). Translating Information from Graphs into Graphs: Signals Processing. Paper presented at eleventh annual Conference on Research in Undergraduate Mathematics Education. San Diego, CA.
- Hjalmarson, M. (2007). Finding the Challenge in Mathematics Curricula. Paper presented at the Annual Meeting of the American Educational Research Association. Chicago, Illinois.
- Baek, J. Y., Xia, Q., Peters, E. E., Martinez, P., Bannan-Ritland, B., & Hjalmarson, M. A. (2007). Design research on the means of support for teaching and learning geological observation. Paper presented at the National Association for Research in Science Teaching Annual International Conference. New Orleans, LA.
- Hjalmarson, M. (2006). Engineering as Bridge for Undergraduate and K-12 Curriculum. Paper presented at ninth annual Conference on Research in Undergraduate Mathematics Education. Piscataway, NJ.
- Wage, K., Buck, J., & Hjalmarson, M. (2006, October). The signals and systems concept inventory. Paper presented at the National STEM Assessment Conference, Washington. D.C.
- Hjalmarson, M. (2005a). Statistical Sampling from a digital image. Presentation at Meetings of Research for Undergraduate Mathematics Education. Phoenix, AZ.
- Hjalmarson, M. (2005b). Teacher as tool designer: Tool design as a view into teacher practice. Paper presented at the Annual Meeting of the American Educational Research Association. Montreal, Canada.
- Hjalmarson, M. A. (2005c). What is learned about engineering students' mathematical modeling? Paper presented at the Annual Meeting of the American Educational Research Association, Montreal.
- Diefes-Dux, H., Follman, D., Zawojewski, J., Capobianco, B., & Hjalmarson, M. (2004, June). Model eliciting activities: An in-class approach to improving persistence and retention of women in engineering. Presentation at the annual conference for the American Society of Engineering Education. Salt Lake City, UT.
- Chamberlin, S., Chamberlin, M., Hjalmarson, M., & Lesh, R. (2003, November). Interdisciplinary problem solving in the 21st century with model-eliciting activities. Presentation at the fiftieth annual conference for the National Association for Gifted Children. Indianapolis, IN.
- Hjalmarson, M., Diefes-Dux, H., Lesh, R. (2003, October). Data analysis in context by first-year engineering students. Presentation at seventh annual Conference on Research in Undergraduate Mathematics Education. Scottsdale, AZ.

- Lesh, R., Carmona, G., Doerr, H., English, L., Hjalmarson, M., & Lamon, S. (2003, July). Models and modeling. Discussion group at the twenty-seventh annual meeting for the International Group for the Psychology of Mathematics Education. Honolulu, HI.
- Carmona, G., Heger, M. & Hjalmarson, M. (2000, November). Developing thought-revealing activities. Presentation at annual meeting for Indiana Council of Teacher's of Mathematics. Indianapolis, IN.
- Hjalmarson, M. & Gummer, E. (2000, October). Model-development sequences: Puppy genetics and StarLogo©. Poster session at twenty-third annual meeting of the Association for the Psychology of Mathematics Education North American Chapter. Tucson, AZ
- Gummer, E. & Hjalmarson, M. (2000, March). Model-development sequences: Puppy genetics and StarLogo©. Teaching, Learning and Technology Poster Session, Purdue University. West Lafayette, IN.
- Hjalmarson, M. (1998, January). Non-edge-to-edge tilings by regular polygons. Undergraduate poster session at Annual Joint Meetings of the American Mathematical Society and the Mathematical Association of America. Baltimore, MD.
- Hjalmarson, M. (1998, April). Non-edge-to-edge tilings by regular polygons. Presentation at Hudson River Undergraduate Mathematics Conference. Schenectady, NY.

### **Invited Talks**

- Hjalmarson, M. (2006, November). Models and Modeling Theory. Invited Presentation at National Changhua University of Education. Changhua, Taiwan.
- Hjalmarson, M. (2006, February). Design Research: What Education Research Can Learn from Engineering. Graduate School of Education Doctoral Seminar Course, Fairfax, VA

### **GRANTS AND CONTRACTS**

**Principal Investigator**, "Linking Interest and Conceptual Knowledge in Electrical Engineering" (\$88,321, Grant No. 0835919, Engineering Education Centers)

- Examine student conceptual knowledge of the mathematics for engineering and their interesting in electrical engineering
- Investigate the use of in-class problem solving on conceptual understanding.

**Senior Staff, National Science Foundation Math and Science Partnership Program Evaluation** (Contract No. 0456995)

- Investigate challenging mathematics content, course and curriculum development in large-scale grant program
- Examine engineering education initiatives across the NSF Math and Science Partnership Program

**Co-Principal Investigator**, “Collaborative Proposal: The Signals and Systems Concept Inventory” (\$153,904.00, Grant No. 0512686, Course Curriculum and Laboratory Improvement – Assessing Student Achievement)

- Investigate application and design of a concept assessment inventory for signals and systems processing in electrical engineering with engineering colleagues from George Mason and University of Massachusetts-Dartmouth

## **WORKSHOPS AND CONSULTING**

Consultant, “Collaborative Research: Improving Engineering Students' Learning Strategies Through Models and Modeling” (NSF # 0717801, University of Pittsburgh). Develop modeling activities for multiple engineering institutions to assess student learning in multiple engineering competencies.

Consultant, “GenSing Project”, National Institute of Education, Singapore. Design assessments and assist with teacher development related to generative algebra activities for middle school students using networked graphing calculators.

Consultant, “Assessing and Evaluating Student Work on Modeling Activities Embedded in a First-Year Engineering Problem Solving Course” (NSF #0535678, Purdue University, 2006-2008). Aiding in the development of principles for assessment of design-based, problem solving activities for a first-year engineering course in the Department of Engineering Education.

Workshop, “Models and Modeling Principles and Activities”. Workshop presented at National Changhua University of Education in Taiwan to elementary and middle school teachers.

## **COURSES TAUGHT**

*Ph.D. Program in Mathematics Education Leadership*

EDCI 857: Preparation and Professional Development of Mathematics Teachers

EDCI 726: State and Local Leadership Issues in Mathematics Education

*Master's Program in Secondary Education*

EDCI 572: Methods of Teaching Secondary Mathematics

EDCI 672: Advanced Methods of Teaching Secondary Mathematics

*Master's Program for Mathematics Specialist Leaders*

EDCI 645: Curriculum Development in Mathematics Education

## **SERVICE**

*External Service*

Proposal Panel Reviewer, National Science Foundation

Manuscript Reviewer, *Journal of Mathematics Teacher Education*  
Manuscript Reviewer, *Journal for Research in Mathematics Education*  
Manuscript Reviewer, *Mathematics Teacher*  
Manuscript Reviewer, *Contemporary Issues in Technology and Mathematics Teacher Education*  
Reviewer, Japan Fulbright Memorial Teacher Fund Program

*Graduate School of Education*

Secondary Education Program

- Advise at least 50 students in master's degree program in secondary mathematics
- Develop programs, assessments, and curriculum for secondary mathematics education specifically and in support of other disciplines in secondary education

Mathematics Education Leadership Program

- Attend state-level meetings of Virginia Mathematics Specialists (October 2004, March 2005)
- Assisted with development and promotion of newly designed Mathematics Specialist Leader Master's degree including mathematics course syllabi.
- Member of portfolio committees for students enrolled in Mathematics Education Leadership doctoral program

Program Assessment Committee for Graduate School of Education

- Development of performance-based assessment and evaluation tools for secondary mathematics education
- Development of performance-based assessment and evaluation tools for Mathematics Specialist Leader track in M.S. for Mathematics Leadership program

Search Committee, Elementary Mathematics Education position (2005-06)

Search Committee, Secondary Education Program Coordinator (2006-07)

Search Committee, Secondary English Education position (2007-08)

Invited presenter to EDUC 805: Doctoral Seminar (Spring 2005, Spring 2006)

**AWARDS AND FELLOWSHIPS**

2006 Honorable Mention – Best Paper Award, Conference for Research in Undergraduate Mathematics Education

Purdue Research Foundation Dissertation Fellowship

Sigma Xi Scientific Society, Mount Holyoke College

**MEMBERSHIP IN PROFESSIONAL SOCIETIES**

American Educational Research Association

American Society for Engineering Education

Association for the Psychology of Mathematics Education, North American Chapter

National Council for Teachers of Mathematics

## **DOCTORAL STUDENTS**

### *Committee Chair*

John Baek (August 2007, Instructional Technology)

### *Committee Member*

Sanford Geraci (December 2008, Higher Education)

Anne Little (expected May 2008, Instructional Technology)

Naomi Perlman (expected December 2007, Psychology)

Chondra Sanders (expected May 2008, Instructional Technology)

Vanessa Rutherford (expected August 2008, Literacy)