

# Samuel John Otten

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Last Updated: April 2012

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## EDUCATION

Doctor of Philosophy candidate, Mathematics Education Michigan State University	Jan. 2008 – present
Master of Science, Mathematics Michigan State University	Aug. 2008
Bachelor of Science, Mathematics, minor in Psychology Grand Valley State University	Apr. 2006
Completion of Secondary Teacher Preparation Program, Mathematics Grand Valley State University	Apr. 2006

## DISSERTATION

*Participation and Cognitive Demand: Linking the Enacted Curriculum and Student Learning in Middle School Algebra*

Committee: Beth Herbel-Eisenmann, Ralph Putnam, Kristen Bieda, Michael Steele

## PUBLICATIONS

### Mathematics Education

Otten, S. (2011). Cornered by the real world: A defense of mathematics. *Mathematics Teacher*, 105, 20–25.

Herbel-Eisenmann, B. A., & Otten, S. (2011). Mapping mathematics in classroom discourse. *Journal for Research in Mathematics Education*, 42, 451–485.

Otten, S., & Corcoran, E. (2011). Teaching teachers about measurement: A varied approach. *PRIMUS*, 21, 316–322.

Otten, S., Herbel-Eisenmann, B. A., & Males, L. M. (2010). Proof in algebra: Reasoning beyond examples. *Mathematics Teacher*, 103, 514–518.

- Males, L. M., Otten, S., & Herbel-Eisenmann, B. A. (2010). Challenges of critical collegueship: Examining and reflecting on study group interactions. *Journal of Mathematics Teacher Education*, *13*, 459–471.
- Kaplan, J., & Otten, S. (2012). Optimization: Teaching old dogs with new tasks. *Mathematics Teacher*, *105*, 686–691.
- Herbel-Eisenmann, B., Cirillo, M., & Otten, S. (2009). Synthesizing the bases of purposeful discourse: Reading, reflecting, and community. In B. Herbel-Eisenmann & M. Cirillo (Eds.), *Promoting purposeful discourse: Teacher research in mathematics classrooms* (pp. 205–217). Reston, VA: National Council of Teachers of Mathematics.
- Otten, S., Gilbertson, N. J., Males, L. M., & Clark, D. L. (2011). Reasoning-and-proving in geometry textbooks: What is being proved? In L. R. Wiest & T. Lamberg (Eds.), *Proceedings of the 33rd annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (pp. 347–355). Reno, NV: University of Nevada.
- Otten, S. (2010). Conclusions within mathematical task enactments: A new phase of analysis. In P. Brosnan, D. B. Erchick & L. Flevares (Eds.), *Proceedings of the 32nd annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (pp. 661–669). Columbus, OH: Ohio State University.
- Otten, S., & Herbel-Eisenmann, B. A. (2009). Multiple meanings in mathematics: Beneath the surface of area. In S. L. Swars, D. W. Stinson, & S. Lemons-Smith (Eds.), *Proceedings of the 31st annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (pp. 296–303). Atlanta, GA: Georgia State University.
- Otten, S. (2010). There's math in the mix. In L. Males, J. Males, & C. Beckmann (Eds.), *Adventures with mathematics: Climbing from grade 6 to grade 7* (p. 41). Ann Arbor, MI: Michigan Council of Teachers of Mathematics.
- Otten, S. (2010). Making room for math. In L. Males, J. Males, & C. Beckmann (Eds.), *Adventures with mathematics: Climbing from grade 6 to grade 7* (p. 47). Ann Arbor, MI: Michigan Council of Teachers of Mathematics.

### **Mathematics**

- Otten, S., & Zin, C. (2012). In a class with Klein: Generating a model of the hyperbolic plane. *PRIMUS*, *22*, 85–96.
- Otten, S. (2007). Do cyclic polygons make the cut? *Mathematics Magazine*, *80*, 138–141.
- Otten, S., & Dogru, F. (2010). A lesson learned from outer billiard derivatives. *American Journal of Undergraduate Research*, *9*(1), 1–7.
- Dogru, F., & Otten, S. (2011). Sizing up outer billiard tables. *American Journal of Undergraduate Research*, *10*(1), 1–8.
- Otten, S. (2009). God? A mathematician challenges the proofs [Review of the book *Irreligion*]. *Math Horizons*, *17*(1), 28–29.

### **In Preparation and Under Review**

- Otten, S., Gilbertson, N. J., Males, L. M., & Clark, D. L. (under review). The mathematical nature of reasoning-and-proving opportunities in geometry textbooks.
- Otten, S., Cirillo, M., & Herbel-Eisenmann, B. A. (under review). Going over homework in mathematics classrooms: An unexamined activity.
- Gilbertson, N. J., Otten, S., Males, L. M., & Clark, D. L. (in preparation). Proof in geometry and in general.
- Koestler, C., Felton, M. D., Bieda, K. N., & Otten, S. (in preparation). *Standards of mathematical practice through the grades*. Reston, VA: National Council of Teachers of Mathematics.
- Steele, M. D., Johnson, K. R., Otten, S., Herbel-Eisenmann, B. A., & Carver, C. (under review). Developing leadership content knowledge: The case of principal learning in algebra.
- Putnam, R. T., Boyer, D. M., Otten, S., & Britton, E. (in preparation). The search for support: A framework for beginning teachers' use of the Internet.
- Putnam, R. T., Britton, E., & Otten, S. (in preparation). Content needs of early career secondary mathematics teachers.
- Heilman, E., & Otten, S. (in preparation). Poststructural theory in mathematics education: Its use, misuse, and possibilities.

## **PRESENTATIONS**

### **National and International**

- Otten, S. (2012, April). *Relationships between student participation, task summaries, and algebra learning*. Poster presented at the research pre-session of the annual meeting of the National Council of Teachers of Mathematics, Philadelphia, PA.
- Bieda, K., & Otten, S. (2012, April). *The standards for mathematical practice: Where have we been and where are we going?* Presentation at the research pre-session of the annual meeting of the National Council of Teachers of Mathematics, Philadelphia, PA.
- Gilbertson, N., Otten, S., & Males, L. M. (2012, April). *Proof in geometry textbooks: Not all opportunities are created equal*. Presentation at the annual meeting of the National Council of Teachers of Mathematics, Philadelphia, PA.
- Males, L. M., Otten, S., Gilbertson, N. G., & Clark, D. L. (2012, April). *Reasoning-and-proving in textbooks: The case of high school geometry*. Paper presented at the annual meeting of the American Educational Research Association, Vancouver, ON.
- Johnson, K. R., Otten, S., Herbel-Eisenmann, B. A., Cirillo, M., & Steele, M. D. (2012, February). *Teacher discourse moves in context*. Presentation at the preconference of the Association of Mathematics Teacher Educators, Fort Worth, TX.

- Otten, S. (2012, February). *More than cognitive demand: Tracing participatory demand of mathematical tasks*. Presentation at the annual conference of the Association of Mathematics Teacher Educators, Fort Worth, TX.
- Otten, S., Herbel-Eisenmann, B. A., Cirillo, M., Steele, M., & Bosman, H. M. (2011, April). *Students actively listening: A foundation for productive discourse in mathematics classrooms*. Paper presented at the annual meeting of the American Educational Research Association, New Orleans, LA.
- Otten, S., & Herbel-Eisenmann, B. A. (2010, May). *Going over mathematics homework in middle grade classrooms*. Poster presented at the annual meeting of the American Educational Research Association, Denver, CO.
- Otten, S., Putnam, R. T., & Britton, E. (2010, May). *Content needs of beginning secondary mathematics teachers*. Paper presented at the annual meeting of the American Educational Research Association, Denver, CO.
- Otten, S. (2010, April). *Communicating with conclusions: Discourse at the end of mathematical tasks*. Presentation at the research pre-session of the annual meeting of the National Council of Teachers of Mathematics, San Diego, CA.
- Herbel-Eisenmann, B., Otten, S., & Males, L. (2010, April). *On the nature of secondary mathematics classroom discourse*. Symposium at the research pre-session of the annual meeting of the National Council of Teachers of Mathematics, San Diego, CA.
- Herbel-Eisenmann, B., Males, L., Otten, S., & Cirillo, M. (2009, April). *Multiple methods for analyzing mathematics classroom discourse*. Symposium at the research pre-session of the annual meeting of the National Council of Teachers of Mathematics, Washington, DC.
- Otten, S., Park, J., Mosier, A., & Kaplan, J. J. (2009, February). *Lesson study as a tool for research: A case of undergraduate calculus*. Paper presented at the 12th conference on Research in Undergraduate Mathematics Education, Raleigh, NC.
- Otten, S. (2005, August). *Outer billiards in the hyperbolic plane*. Presentation at the MathFest conference of the Mathematical Association of America, Albuquerque, NM.

### Local and Regional

- Otten, S. (2012, March). *Participation, practices, and learning in middle school algebra: A dissertation on the enacted curriculum*. Presentation at the Mathematics Learning Research Group of Michigan State University, East Lansing, MI.
- Otten, S., & Bieda, K. N. (2012, February). *Understanding the standards for mathematical practice at the secondary level*. Presentation at the Math in Action conference of Grand Valley State University, Allendale, MI.
- Otten, S., Theakston, A., Johnson, K., Herbel-Eisenmann, B., Steele, M. D., & Cirillo, M. (2011, August). *Comparing area and perimeter: What do students have to say?* Presentation at the annual meeting of the Michigan Council of Teachers of Mathematics, Macomb, MI.

- Johnson, K. R., Theakston, A., Otten, S., Steele, M. D., Cirillo, M., & Herbel-Eisenmann, B. (2011, August). *Facilitating lesson planning with new teachers*. Presentation at the annual meeting of the Michigan Council of Teachers of Mathematics, Macomb, MI.
- Otten, S., Nimtz, J., Todd, R., Steele, M., Cirillo, M., & Herbel-Eisenmann, B. (2011, February). *Mathematical language: The relationship between context and precision*. Presentation at the Math in Action conference of Grand Valley State University, Allendale, MI.
- Otten, S., Gilbertson, N., Males, L., & Clark, D. (2011, February). *Reasoning-and-proof in geometry textbooks: Considering mathematical statements and students' activities*. Presentation at the Mathematics Learning Research Group of Michigan State University, East Lansing, MI.
- Otten, S., Bosman, H. M., Johnson, K. R., & Males, L. M. (2010, August). *Using math talk moves to promote rich mathematical discussions*. Presentation at the annual meeting of the Michigan Council of Teachers of Mathematics, Macomb, MI.
- Otten, S. (2010, March). *The cognitive demand of mathematical task conclusions*. Presentation at the annual Graduate Academic Conference at Michigan State University, East Lansing, MI.
- Otten, S., Males, L., Muirhead, F., & Bosman, H. (2010, February). *Talk moves in secondary mathematics classrooms: Toward a discourse-focused professional development curriculum*. Presentation at the Math in Action conference of Grand Valley State University, Grand Rapids, MI.
- Males, L., Bell, C., Dolan, J., Enders, C., Ledebuhr, W., & Otten, S. (2010, February). *Grade 6 summer math carnival*. Presentation at the Math in Action conference of Grand Valley State University, Grand Rapids, MI.
- Otten, S. (2010, January). *When the ends justify the meanings: Exploring conclusions of middle school mathematical tasks*. Presentation to the Mathematics Learning Research Group of Michigan State University, East Lansing, MI.
- Mosier, A., Otten, S., & Oslund, J. (2009, November). *Research methods workshop*. Presentation to the Mathematics Learning Research Group of Michigan State University, East Lansing, MI.
- Otten, S., & Zin, C. (2009, May). *A student-generated model of the hyperbolic plane*. Presentation at the Michigan section meeting of the Mathematical Association of America, Mount Pleasant, MI.
- Otten, S. (2007, November). *An introduction to Morse theory*. Presentation at the differential geometry student seminar of Michigan State University, East Lansing, MI.
- Otten, S. (2007, February). *An introduction to  $SO(3)$  from various perspectives*. Presentation at the algebraic topology student seminar of Michigan State University, East Lansing, MI.
- Otten, S. (2006, April). *Results in outer billiards*. Presentation at the mathematics department seminar of Grand Valley State University, Allendale, MI.

Otten, S. (2006, March). *Outer billiards at infinity*. Presentation at the Student Scholarship Day of Grand Valley State University, Allendale, MI.

Otten, S. (2005, March). *An introduction to non-Euclidean geometry*. Presentation at the Student Scholarship Day of Grand Valley State University, Allendale, MI.

### Invited

Otten, S. (2010, November). *Mathematical task enactments in middle school: The emergence of a conclusion phase*. Poster presented at the Conference on Research on the Enacted Mathematics Curriculum, Tampa, FL.

Otten, S. (2010, August). *An introduction and orientation for graduate teaching assistants*. Presentation at the Teaching Assistant Seminar on College Teaching at Michigan State University, East Lansing, MI.

Otten, S. (2010, May). *Confronting department closures*. Presentation at the national conference of the Alliance of Graduate Employee Locals of the American Federation of Teachers, Madison, WI.

Squires, L., & Otten, S. (2009, November). *Contract enforcement: Grievances*. Presentation at the national conference of the Alliance of Graduate Employee Locals of the American Federation of Teachers, East Lansing, MI.

Otten, S. (2009, March). *Lessons from lesson study and a model of the hyperbolic plane*. Presentation at the mathematics department seminar of Grand Valley State University, Allendale, MI.

Kaplan, J., Cervello, K., Corcoran, E., Otten, S., Park, J., & Mosier, A. (2009, February). *Lesson study in undergraduate calculus*. Presentation in the mathematics education colloquium series of Michigan State University, East Lansing, MI.

Otten, S. (2007, May). *Engaging in educational pursuits*. Keynote address at the honors banquet of the Rudyard Area Scholastic Achievement Council, Sault Ste. Marie, MI.

### GRANTS AND ADDITIONAL FUNDING

Dissertation Fellowship Spencer and the National Academy of Education	Under Review
Dissertation Completion Fellowship Michigan State University College of Natural Science	Jan. 2012 – Apr. 2012
Summer Research Continuation Fellowship Michigan State University College of Natural Science	May 2010 – Aug. 2010
Student Summer Scholar, Research Grant Grand Valley State University	May 2005 – Aug. 2005

### RESEARCH AND DEVELOPMENT ACTIVITIES

Principal Investigator	May 2010 –
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- Mathematics Education present  
*Reasoning-and-Proving in High-School Geometry Textbooks*  
 Funding: Michigan State University College of Natural Science
- Graduate Assistant Aug. 2009 –  
 Mathematics Education present  
*Mathematics Discourse in Secondary Classrooms: A Case-Based Professional Development Curriculum*  
 Principal Investigators: Beth Herbel-Eisenmann, Michael Steele, Michelle Cirillo  
 Funding: National Science Foundation
- Research Assistant May 2008 –  
 Mathematics and Science Education Aug. 2010  
*Research on MSP Teacher Recruitment, Induction, Retention*  
 Principal Investigators: Edward Britton, Ralph T. Putnam  
 Funding: National Science Foundation
- Research Assistant Feb. 2008 –  
 Mathematics Education Dec. 2009  
*Discourse Analysis: A Catalyst for Reflective Inquiry in Math Classrooms*  
 Principal Investigator: Beth Herbel-Eisenmann  
 Funding: National Science Foundation
- Data Collector Jun. 2008 –  
 Mathematics Education Aug. 2008  
*Quantitative Literacy Study*  
 Principal Investigators: Dennis Gilliland, Vince Melfi  
 Funding: Michigan State University
- Data Collector Mar. 2009 –  
 Mathematics Education May 2009  
*CyberChase Project: Children's Learning from Multiple Media in Informal Mathematics Education*  
 Principal Investigators: Sandra Crespo, Shalom Fisch, Richard Lesh, Vince Melfi, Sandra Sheppard  
 Funding: National Science Foundation
- Student Researcher Jan. 2005 –  
 Mathematics Aug. 2005  
*Outer Billiards in the Hyperbolic Plane*  
 Faculty Advisor: Filiz Dogru  
 Funding: Grand Valley State University Student Summer Scholars Program

## TEACHING

- Teaching Assistant Aug. 2006 –  
 Michigan State University present

Department of Teacher Education

*Secondary Teacher Preparation Team, Field Instructor (2 semesters)*

Department of Counseling, Educational Psychology, and Special Education

*CEP 805 Learning Mathematics with Technology (online course; 2 semesters)*

Department of Mathematics

*MTH 103 College Algebra (3 semesters)*

*MTH 201 Number and Operations Content for Elementary Teachers (1 semester)*

*MTH 202 Geometry Content for Elementary Teachers (1 semester)*

*MTH 496 Mathematics Capstone for Secondary Teachers (1 semester)*

Tutor, Mathematics	Sep. 2010 –
Private	present
Worked with a high school student throughout geometry and advanced algebra.	
Tutor, Mathematics	Aug. 2006 –
Michigan State University	Apr. 2008
Assisted individuals and small groups with calculus and abstract algebra in the Mathematics Learning Center. Tutored linear algebra privately.	
Substitute Teacher (Elementary & Secondary)	Apr. 2006 –
Various Schools, MI	Jun. 2006
Served as general substitute in various grades. Classes included algebra, trigonometry, and three consecutive days in a middle school mathematics classroom.	
Student Teacher, Mathematics (Grades 11 & 12)	Dec. 2005 –
Muskegon High School, Muskegon, MI	Apr. 2006
Co-created curriculum and taught remedial <i>Mathematical Proficiency</i> . Taught <i>Integrated 4</i> . Advised two extra-curricular student clubs.	
Teaching Assistant, Mathematics (Grade 8)	Aug. 2005 –
East Grand Rapids Middle School, East Grand Rapids, MI	Dec. 2005
Taught <i>Algebra</i> and <i>Geometry</i> from the <i>University of Chicago School Mathematics Project</i> .	
Teaching Assistant, Mathematics (Grade 10)	Feb. 2005 –
Black River Charter School, Holland, MI	Apr. 2005
Assisted with the teaching of <i>Core-Plus Mathematics</i> .	
Tutor, Mathematics	Aug. 2002 –
Grand Valley State University	Dec. 2003
Supported and instructed calculus material on an individual basis.	

## HONORS AND AWARDS

Dean's Scholar Award	2008 – 2012
Michigan State University College of Education	



Rasmussen Fellowship Michigan State University Graduate School	2008
<i>Summa cum Laude</i> Grand Valley State University	2006
Outstanding Student Award, Mathematics Grand Valley State University	2006
Outstanding Graduate Award Grand Valley State University Department of Mathematics	2006
Merit Scholarship Grand Valley State University Department of Mathematics	2005
Outstanding Freshman Award Phi Kappa Phi Honor Society	2003
Presidential Scholarship Grand Valley State University	2002 – 2006
Co-Valedictorian Rudyard High School	2002
Principal's Award Rudyard High School	2001

## SERVICE

### National Level

Reviewer, <i>Scientific Research and Essays</i> Academic Journals	2011
Member, Conference Steering Committee Conversations Among Colleagues	2010 – present
Reviewer, Annual Conference Int. Grp. for the Psychology of Mathematics Education (North America)	2010 – present
Reviewer, Annual Conference American Educational Research Association	2009 – present
Reviewer, <i>Mathematics Teacher</i> National Council of Teachers of Mathematics	2008 – present
Creator & Manager, Wikispace of Mathematics Education Resources <a href="http://mathedjournals.wikispaces.com">http://mathedjournals.wikispaces.com</a>	2009 – present

### University Level

Graduate Student Ambassador, Mathematics Education Michigan State University	2008 – present
President, Graduate Employees Union Michigan State University	2010 – 2011
Practicum Committee member, Jamie Wernet Michigan State University (Mathematics Education)	2010 – 2011
Practicum Committee member, Julie Nurnberger-Haag Michigan State University (Educational Psychology)	2010 – 2011
Co-Organizer, Mathematics Learning Research Group Michigan State University	2009 – 2010
Vice President, Graduate Employees Union Michigan State University	2009 – 2010
Grievance Committee Chair, Graduate Employees Union Michigan State University	2008 – 2010
Departmental Steward, Graduate Employees Union Michigan State University	2006 – 2009

### **PROFESSIONAL ORGANIZATIONS**

Association of Mathematics Teacher Educators	2011 – present
Michigan Council of Teachers of Mathematics	2010 – present
Int. Group for Psychology of Mathematics Education (North America)	2009 – present
American Educational Research Association	2008 – present
Mathematical Association of America	2006 – present
National Council of Teachers of Mathematics	2005 – present
American Mathematical Society	2005 – 2009