

# John Gruver, PhD

Michigan Technological University  
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## EDUCATION

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### **Ph.D., Mathematics Education**

*September 2011 – July 2016*

Joint Doctoral Program Operated by

San Diego State University & University of California, San Diego

*Dissertation Title:* Exploring the Relationships between Emergent Mathematical Practices, Individuals' Ways of Reasoning, and Meanings Constructed through Discourse

*Research:* Investigation of the connections between mathematical progress attained at both collective and individual levels and classroom discourse

*Dissertation Committee:* Joanne Lobato (Chair), Chris Rasmussen, Janet Bowers, Jay Lemke and Alan Daly

### **M.S., Mathematics**

*September 2009 – April 2011*

Brigham Young University

*Project Title:* A Geometric Approach to a Formula for the Sum of the First  $n$  Integers to the  $k^{\text{th}}$  Power

*Project:* Proved the formulas for the sum of the first  $n$  integers to the  $k^{\text{th}}$  power in a novel way

*Project Committee:* David G. Wright (Chair), Gregory R. Conner and Wayne W. Barrett

### **M.A., Mathematics Education**

*September 2008 – August 2010*

Brigham Young University

*Thesis Title:* Growth in Students' Conceptions of Mathematical Induction

*Research:* Investigated the nature of the reciprocal relationship between three students' cognition and their learning experiences in the context of learning mathematical induction

*Project Committee:* Robert Speiser (Chair), Charles N. Walter and Tyler J. Jarvis

### **B.S. and Teaching Credential, Mathematics and Mathematics Education**

*September 2001 – April 2008*

Brigham Young University

## JOURNAL ARTICLES

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Gruver, J. (Accepted). An instructional trajectory for developing conceptual understanding of exponential and logarithmic relationships. *Journal for Mathematical Behavior*.

Lobato, J., Walters, C. D., Hohensee, C., Gruver, J., & Diamond, J. M. (2015). Leveraging failure in design research. *ZDM—The International Journal on Mathematics Education*.

Bowers J., Gruver J. & Trang V. (2014). Radical constructivism: A theory of individual and collective change? *Constructivist Foundations*. 9(3): 310–312.

Gruver, J. (Submitted). Exploring Relationships Between Students' Individual Ways of Reasoning and Normative Ways of Reasoning.

Hawthorne, C. W., & Gruver, J. (In Preparation). Characterizing Rehearsals with In-Service Teachers.

Gruver, J., & Bowers, J. (In Preparation). The evolution of inquiry. *Educational Action Research*.

Bowers, J., Gruver, J., & Nickerson, S. (In Preparation). Prospective teachers decompose practice around the standards.

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#### REFEREED CONFERENCE PROCEEDINGS

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Gruver, J. (2018). Using discourse analysis to understand variation in students' reasoning from accepted ways of reasoning. *Proceedings of the 39<sup>th</sup> annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education*.

Gruver, J. (2017). Exploring the relationship between accepted ways of reasoning in the classroom and individuals' ways of reasoning. In B. Kaur, W. K. Ho, T. L. Toh, & B. H. Choy (Eds.), *Proceedings of the 41<sup>st</sup> annual meeting of the International Group for the Psychology of Mathematics Education*. (Vol. 2, pp. 377-384). Singapore: PME.

Bowers, J., Gruver, J., Nickerson, S., Roschelle, J., & Druken, B. (2013) Simulating clinical experiences: Pre- and in-service teachers' efforts to create animated simulations of teaching scenarios. In M. Martinez & A. Superfine (Eds.), *Proceedings of the 35<sup>th</sup> annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (p. 910). Chicago, IL: University of Illinois at Chicago.

Bowers, J., Fredenberg, M., & Gruver, J. (2012). Pre-service teachers' interpretations of the Common Core Standards: A comparative study along three dimensions. In L. R. Van Zoest, J. J. Lo, & J. L. Kratky (Eds.), *Proceedings of the 34<sup>th</sup> annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (p. 782). Kalamazoo, MI: Western Michigan University.

Bowers, J., Fredenberg, M., Gruver, J., & Roschelle, J. (2012). Using technology to gauge prospective teachers' interpretations of the Common Core Standards. In P. Resta (Ed.), *Proceedings of Society for Information Technology & Teacher Education International Conference 2012* (pp. 1317-1325). Chesapeake, VA: AACE.

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#### SCHOLARLY PRESENTATIONS

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Bowers, J., Gruver, J. (2016, February). *Preservice Teachers' Impressions of the Standards for Mathematical Practice: Contrasting Two Levels of Experiential Authenticity*. Paper presented at the 20<sup>th</sup> annual conference of the Association of Mathematics Teacher Educators (AMTE), Irvine, CA.

Gruver, J. (2015, November). *Developing conceptual understanding of logarithms*. Paper presented at the Western Regional Noyce Conference, San Diego, CA.

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Bowers, J., Gruver, J., & Bezuk, N. (2015, February). *Taking the road less-traveled in PD: The collective emergence of an “inquiry habit of mind”*. Paper presented at the 19<sup>th</sup> annual conference of the Association of Mathematics Teacher Educators (AMTE), Orlando, FL.

Gruver, J. (2013, January). *The danger of narrow calculus assessments and how to broaden them*. Paper presented at the Joint Mathematics Meeting of the American Mathematical Society and the Mathematical Association of America, San Diego, CA.

Gruver, J. (2012, June). *Assessing calculus knowledge*. Poster presented at the conference on Transforming Research in Undergraduate STEM education (TRUSE), St. Paul, MN.

Nickerson, S., Gruver, J., & Druken, B. (2012, February). *Developing TPACK in prospective middle school mathematics teachers*. Paper presented at the 16<sup>th</sup> annual conference of the Association of Mathematics Teacher Educators (AMTE), Fort Worth, TX.

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#### GRANT ACTIVITY

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**Principal Investigator**

*Under Review*

The Spencer Foundation

*Project Title:* Investigating Students’ Individual Mathematical Interpretations of Dialogue-Intensive Mathematics Videos (\$49,792)

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#### RESEARCH EXPERIENCE

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**Research Assistant**

*September 2014 – August 2015*

Center for Research on Educational Equity, Assessment, and Teaching Excellence (CREATE) at the University of California, San Diego

*Project Title:* Investigation into the Quick Approximate Mental Arithmetic (QAMA) calculator

*Funded by:* CREATE. Monica Sweet (PI) and Larry McClure (co-PI)

**Research Assistant**

*September 2012 – August 2014*

University of California, San Diego

*Project Title:* Project ICON: Investigating the complexity of Networks,

*Funded by:* The Yankelovich Center at UCSD. Alan Daly (PI) and Nienke Moonlenaar (co-PI)

**Research Assistant**

*September 2011 – August 2013*

San Diego State University

*Grant Title:* A Digital Resource for Developing Mathematics Teachers’ TPACK

*Funded by:* National Science Foundation Grant Award (#0918339), Jeremy Roschelle (PI), Susan Corey, Janet Bowers, Jose Blackorby, & Charles Patton (co-Pis)

**Research Assistant**

*September 2011 – August 2013*

San Diego State University

*Grant Title:* Inquiry in Mathematics Teaching and Learning

*Funded by:* California Mathematics and Science Partnership Grant Award (#13-14513-6799-00), Joan Commons (PI), Janet Bowers, Nadine Bezuk, & Steve Klass (co-Pis)

**Research Assistant**

*Spring 2012*

San Diego State University

*Grant Title:* Coordinating Social and Individual Aspects of Generalizing Activity: A Multi-tiered 'Focusing Phenomena' Study

*Funded by:* National Science Foundation Grant Award (DRL-0529502), Joanne Lobato (PI), Amy Ellis (co-PI)

**Problem Writer**

*March 2010*

Brigham Young University

*Project Title:* Vertical Scale Test Development

*Funded by:* The McKay School of Education, Damon L Bahr (PI), Richard R. Sudweeks (co-PI)

**Research Assistant**

*Summer 2009*

Brigham Young University

*Project Title:* The Student of Teaching Project

Keith Leatham, Blake E. Peterson

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COLLEGIATE TEACHING EXPERIENCE

**Assistant Professor**

*Spring 2017*

Michigan Technological University

*Course Title:* Mathematical Experimentation (MA 2910)

**Assistant Professor**

*Fall 2016, 2017*

Michigan Technological University

*Course Title:* College Geometry (MA 3924)

**Assistant Professor**

*Fall 2016, 2017*

Michigan Technological University

*Course Title:* Calculus with Technology I (MA 1161)

**Instructor**

*Fall 2015, Spring 2016*

San Diego State University

*Course Title:* Number Systems in Elementary Mathematics (Math 210)

**Instructor**

*January 2013*

San Diego State University

*Course Title:* Algebra in the Secondary School Curriculum

*Funded By:* Math/Science Teacher Initiative (MSTI)

- Helped strengthen the mathematical content knowledge of pre- and in-service elementary school teachers preparing to take the *California Subject Examination for Teachers* in order to qualify to teach mathematics in middle school

**University Supervisor of Student Teachers**  
Brigham Young University

*Winter 2011*

**Instructor**  
Brigham Young University

*Fall 2009, Winter 2010, and Fall 2010*

*Course Title:* Concepts of Mathematics (MathEd 306)

**Instructor**  
Brigham Young University

*Summer 2010*

*Course Title:* College Algebra (Math 110)

**Instructor**  
Brigham Young University

*Winter 2009*

*Course Title:* Trigonometry (Math 111)

**Teaching Assistant**  
Brigham Young University Fall 2008

*Brigham Young University*

*Course Title:* Calculus (Math 112)

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#### PROFESSIONAL DEVELOPMENT EXPERIENCE

**Facilitator**  
Greenville County School District

*June 2017*

*Project Title:* Leading Figural Pattern Tasks

- Helped plan and lead sessions in the professional development

**Graduate Student Assistant**  
Cajon Valley Unified & National School Districts

*September 2011 – August 2013*

*Project Title:* Inquiry in Mathematics Teaching and Learning

- Helped plan the summer and winter intensives, i.e. deciding what content to focus on as well as planning the individual sessions
- Lead sessions in the professional development

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#### K-12 TEACHING EXPERIENCE

**Observer**  
University of California, San Diego

*Winter, 2015*

*Course Title:* Pre-calculus

- Observed 40 hours of instruction among four different high schools

**Teaching Assistant**  
University of California, San Diego  
Patrick Henry High School

*Winter, 2012*

*Course Title:* Geometry

- Meet with the instructor of the course to discuss student thinking
- Developed a unit, with the course instructor, set in a real world context, in which students made and proved conjectures about isosceles triangles
- Taught several of the lessons in the unit

**Observer**  
University of California, San Diego

*Winter, 2012*

*Course Title:* Calculus

- Observed 40 hours of instruction among four different high schools
- Meet with the instructors to talk about their pedagogical approach and why they made the decisions they made

**Student Teacher**  
Brigham Young University  
Mountain View High School

*January 2008 – April 2008*

*Course Title:* Algebra I

- Taught students about linear functions and solving systems of equations
- Developed meaning oriented unit on combinations and permutations

#### AWARDS

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<b>Winter 2015 Graduate Student Association Travel Grant Winner (\$500)</b>	<i>February 2015</i>
<b>Transforming Research in Undergraduate Stem Education (TRUSE) Conference Travel Award (\$400)</b>	<i>June 2012</i>
<b>Spring Research Conference Session Winner</b>	<i>March 2010</i>

#### SERVICE

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<b>Undergraduate Committee Member</b> Michigan Technological University	<i>Fall 2017-Present</i>
<b>Advocacy Committee Member</b> MI-AMTE	<i>Fall 2017-Present</i>
<b>Board Member-at-Large</b> MI-AMTE	<i>January 2018-Present</i>
<b>Graduate Student Representative</b>	<i>Fall 2013</i>

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San Diego State University  
University of California, San Diego

**Student Search Committee Member**  
San Diego State University

*Fall 2013*

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REFERENCES

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**Dr. Joanne Lobato**

Department of Mathematics  
San Diego State University  
6475 Alvarado Road, Suite 206  
San Diego, CA 92120  
Tel: (619) 594-2957  
Fax: (619) 594-1581  
Email: [jlobato@mail.sdsu.edu](mailto:jlobato@mail.sdsu.edu)

Chair of dissertation committee  
Professor for two of my graduate math ed courses  
Supervising researcher for research rotation

**Dr. Janet Bowers**

Department of Mathematics  
San Diego State University  
6475 Alvarado Road, Suite 206  
San Diego, CA 92120  
Tel: (619) 594-6191  
Fax: (619) 594-1581  
Email: [jbowers@mail.sdsu.edu](mailto:jbowers@mail.sdsu.edu)

Dissertation committee member  
Supervising researcher for two research assistantships

**Dr. Chris Rasmussen**

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San Diego State University  
6475 Alvarado Road, Suite 206  
San Diego, CA 92120  
Tel: (619) 594-1581  
Fax: (619) 594-1581  
Email: [crasmussen@mail.sdsu.edu](mailto:crasmussen@mail.sdsu.edu)

Dissertation committee member  
Professor for one of my graduate math ed courses