

Robert A. Powers

Summer 2016

POSITION: Professor  
School of Mathematical Sciences  
College of Natural and Health Sciences  
University of Northern Colorado  
Greeley, CO 80639-0098S

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EDUCATION:

| <u>Year</u> | <u>Degree</u> | <u>Institution</u>        | <u>Area of Study</u>                              |
|-------------|---------------|---------------------------|---|
| 2001        | Ed.D.         | University of Houston     | Curriculum and Instruction, Mathematics Education |
| 1990        | M.S.          | Colorado State University | Mathematics                                       |
| 1988        | B.S.          | Colorado State University | Mathematics, Physics minor                        |

WORK EXPERIENCE:

| <u>Years</u> | <u>Institution/Organization</u> | <u>Position</u> | <u>Responsibilities</u> |
|--------------|---------------------------------|-----------------|-------------------------|
| 2013 present |                                 |                 |                         |

Refereed Articles:

- Hauk, S., Powers, R. A., & Segalla, A. (2014). A comparison of web-based and paper-and-pencil homework on student performance in college algebra. *PRIMUS*, 24, 1-19.
- Chamberlin, S. A., & Powers, R. A. (2013). Assessing affect after mathematical problem solving tasks: Validating the Chamberlin Affective Instrument for Mathematical Problem Solving. *Gifted Education International*, 29(1), 69-85.
- Waxman, H. C., Rivera, H., & Powers, R. (2012). English language learners' educational resilience and classroom learning environment. *Educational Research Quarterly*, 35(4), 53-72.
- Chamberlin, M. T., & Powers, R. A. (2010). The promise of differentiated instruction for enhancing the mathematical understandings of college students. *Teaching Mathematics and Its Applications: An International Journal of the Institute of Mathematics and Its Applications*, 29(3), 113-139.
- Powers, R. A., Craviotto, C., & Grassl, R. M. (2010). Impact of proof validation on proof writing in abstract algebra. *International Journal of Mathematical Education in Science and Technology*, 41(4), 501-514.
- Chamberlin, M. T., Powers, R. A., & Novak, J. D. (2008). content knowledge assessments in professional development courses. *International Electronic Journal of Mathematics Education*, 3(3), 155-178.
- Chamberlin, M. T., & Powers, R. A. (2007, May). Selecting from three curricula for a preservice elementary teacher geometry course. *Issues in the Undergraduate Mathematics Preparation of School Teachers: The Journal*, 4. Retrieved from <http://www.k-12prep.math.ttu.edu>
- Powers, R. A., Allison, D. E., & Grassl, R. M. (2006). A study of the use of a handheld computer algebra system in discrete mathematics. *The International Journal for Technology in Mathematics Education*, 12(3), 103-114.
- Powers, R., & Blubaugh, W. (2005). Technology in mathematics education: Preparing teachers for the future. *Contemporary Issues in Technology and Teacher Education* [Online serial], 5(3/4). Available: <http://www.citejournal.org/vol5/iss3/mathematics/article1.cfm>
- Farmer, J., & Powers, R. A. (2005). Exploring Mayan numerals. *Teaching Children Mathematics*, 12, 69-79.
- Banta, M., Brewer, R., Hansen, A., Ku, H. Y., Pacheco, K., Powers, R., Robinson, J., & Tucker,

*meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (pp. 1252-1255).

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##### Invited Publications:

Powers, R. A., & Farmer, J. D. (submitted). Exploring Mayan numerals lesson plan. In S. McMillen (Ed.), *Integrating Mathematics*. Reston, VA: NCTM.

##### Other Publications:

Powers, R. A. (2001). *Factors affecting the implementation of mathematics education reform practices in high school algebra*. Unpublished doctoral dissertation, University of Houston, Houston, TX.

##### Works in Progress:

Chamberlin, S. A., & Haynes, A., & Powers, R. A. (2013). *An analysis of teacher questioning in secondary mathematics classes*. Manuscript in preparation.

Powers, R. A., Judd, A. B., Novak, J. D. (2013). *Learning to teach through lesson experiment*. Manuscript in preparation

Powers, R. A., & Parker, F. (2013). *Motivation in un*

- Seventeenth Annual Conference of the Association of Mathematics Teacher Educators, Orlando, FL.
- Parker, C. F., Powers, R. A., Novak, J. D. (2013, January). *Structured task analysis as a means of teacher PCK development in professional development*. Presentation at the Seventeenth Annual Conference of the Association of Mathematics Teacher Educators, Orlando, FL.
- Powers, R., & Glassmeyer, D. (2012, February). *Professional development at a distance: Designing and facilitating online courses for inservice mathematics teachers*. Preconference session presentation at the Sixteenth Annual Conference of the Association of Mathematics Teacher Educators, Fort Worth, TX.
- Chamberlin, S. A., & Powers, R. A. (2011, October). *Assessing affect among upper elementary students who are gifted in mathematics: An exploratory study*. Paper presented at the Thirty-third Annual Conference of the North American Chapter of the International Group for the Psychology of Mathematics Education. Reno, NV.
- Powers, R. A., Ku, H-Y., & Mayes, R. (2011, March). *Online teacher professional development in mathematics education*. Paper presented at the Twenty-second International Conference of the Society for Information Technology & Teacher Education, Nashville, TN.
- Powers, R. A., Glassmeyer, D. M., Ku, H-Y. (2011, February). *The impact of technology on a graduate mathematics education course*. Paper presented at the Fourteenth Annual Conference on Research in Undergraduate Mathematics Education, Portland, OR.
- Powers, R., & Novak, J. (2011, January). *Using authentic scholarly practice in an online teacher professional development course*. Round table presentation at the Fifteenth Annual Conference of the Association of Mathematics Teacher Educators, Irvine, CA.
- Powers, R., & Judd, A. (2011, January). *The impact on novice teachers' practice after learning to teach from their teaching*. Presentation at the Fifteenth Annual Conference of the Association of Mathematics Teacher Educators, Irvine, CA.
- Powers, R., & Novak, J. (2010, October). *Learning to teach better from your own teaching: Ways to treat lessons as experiments*. Presentation at the NCTM 2010 Regional Conference and Exposition, Denver, CO.
- Powers, R. A., & Judd, A. (2010, January). *Preparing mathematics teachers to learn to teach from their teaching*. Paper presented at the Fourteenth Annual Conference of the Association of Mathematics Teacher Educators, Irvine, CA.
- Novak, J. D., Powers, R. A., & Judd, A. (2009, April). *The lesson experiment: Learning to learn from teaching*. Paper presented at the Annual Conference of the National Council of Supervisors of Mathematics, Washington, DC.
- Powers, R. A., & Novak, J. D. (2009, February). *Improving professional development through lesson experiments*. Presentation at the Thirteenth Annual Conference of the Association of Mathematics Teacher Educators, Orlando, FL.
- Powers, R. A., & Champion, J. (2008, March). *Teaching and learning college algebra with the TI-Navigator® wireless handheld network*. Paper presented at the Twentieth Annual International Conference on Technology in Collegiate Mathematics, San Antonio, TX.
- Hauk, S., Powers, R., & Allison, D. (2007, September). *University of Northern Colorado School of Mathematical Sciences PhD in educational mathematics*. Poster presented at the Doctoral Program in Mathematics Education: A Decade of Progress, Kansas City, MO.
- Waxman, H. C., Rivera, H. H., & Powers, R. A. (2006, April). *Classroom and instructional learning environment differences in reading between resilient, average, and non-resilient students*. Paper presented at the annual meeting of the American Educational Research Association, San Francisco, CA.

- Chamberlin, M. T., & Powers, R. (2006, January). *without compromising the supportive learning environment A follow-up*. Paper presented at the Tenth Annual Conference of the Association of Mathematics Teacher Educators, Tampa, FL.
- Powers, R. (2005, November). *Three-dimensional solids in geometry: A group assessment of pre-service teachers*. Paper presented at the School Science and Mathematics Association 2005 Convention, Fort Worth, TX.
- Powers, R. (2005, November). *Preparing mathematics teachers to be comfortable at using appropriately classroom technology*. Paper presented at the School Science and Mathematics Association 2005 Convention, Fort Worth, TX.
- Blubaugh, W. L., & Powers, R. A. (2003, January). *Tools and technology of secondary mathematics*. Paper presented at the Seventh Annual Association of Mathematics Teacher Educators Conference, Atlanta, GA.
- Padrón, Y. N., Waxman, H., Powers, R. A., & Brown, A. (2001, April). *Evaluating the effects of the Pedagogy for Improving Resiliency Program: The challenges of school reform in a high-stakes testing climate*. Paper presented at the annual meeting of the American Educational Research Association, Seattle.
- Waxman, H., Powers, R. A., Houston, W. R., & Cortina, L. (2001, April). *The relations between developmentally-appropriate practices and family-centered child care practices*. Paper presented at the annual meeting of the American Educational Research Association, Seattle, WA.

- Powers, R. A. (2010, April). *Lesson experiments: A teacher-scholar model of learning to teach*. Center for the Enhancement of Teaching and Learning Teaching and Learning Fair, Greeley, CO.
- Powers, R. A. (2009, October). *The Math TLC: Creating a cadre of highly qualified, culturally competent, and pedagogically effective secondary teachers*. University of Delaware EDUC 838 Research Issues in Mathematics Education, Newark, DE.
- Powers, R. A. (2008, November). *The professional development of secondary teachers through lesson experiments*. College of Natural and Health Sciences Distinguished Lecturer Series, Greeley, CO.
- Powers, R. A. (2008, September). *APA style*. MED 610 Survey of Research in Mathematics Education, Greeley, CO.
- Chamberlin, M., & Powers, R. (2006, March). *A mixed methods approach to investigating assessment in professional development*. Applied Statistics and Research Methods Program Seminar, Greeley, CO.
- Chamberlin, M., & Powers, R. (2005, February). *Mathematics instruction with the SMART Board*. Department of Mathematical Sciences, Greeley, CO.

#### Non-Juried:

##### Papers/Professional Society Poster Sessions:

- Morgan, M., & Powers, R. (2015, September). *Using high cognitive demand tasks to foster successful classroom discussions*. Presentation at the Colorado Council of Teachers of Mathematics 2015 Conference, Denver, CO.
- Powers, R. A. (2015, September). *Data displays across grade levels*. Presentation at the Colorado Council of Teachers of Mathematics 2015 Conference, Denver, CO.
- Powers, R. A. (2014, September). *Preparing a launch-explore-summary lesson*. Presentation at the Colorado Council of Teachers of Mathematics 2014 Conference, Denver, CO.
- Seehausen, A., & Powers, R. A. (2014, September). *How preservice teachers' engage in the pivotal teaching moment project*. Presentation at the Colorado Council of Teachers of Mathematics 2014 Conference, Denver, CO.
- Powers, R. A. (2012, September). *Interrelations and partnerships between K-12 and higher education*. Presentation at the Rocky Mountain Association of Mathematics Teacher Educators, Denver, CO.
- Crossley, S., & Powers, R. (2011, October). *How will lesson experiments that involve cognitively misconceptions of mathematical content?* Presentation at the Colorado Council of Teachers of Mathematics 2011 Conference, Denver, CO.
- Powers, R., & Judd, A. (2009, April). *Professional development of secondary teachers through lesson experiments*. Presentation at the Mathematical Association of America Rocky Mountain Section Meeting, Golden, CO.
- Powers, R. A., Novak, J., & Sasse, E. A. (2008, September). *Metacooperative learning: A model for doing mathematics*. Paper presented at the Colorado Council of Teachers of Mathematics 2008 Conference, Denver, CO.
- Powers, R. (2008, September). *Lesson experiment: A way to learn from teaching*.

- Chang, W., & Powers, R. (2007, July). *An investigation and analysis of demiregular tessellations*. Frontiers of Science Institute, Mathematics and Science Teaching Institute, University of Northern Colorado, Greeley, CO.
- Duong, A., Champion, J., & Powers, R. (2007, July). *Using the TI-Navigator system in improving mathematics teaching methods*. Frontiers of Science Institute, Mathematics and Science Teaching Institute, University of Northern Colorado, Greeley, CO.
- Powers, R. (2007, April). *Applying the Synectics method of instruction to writing in mathematics*. Mathematical Association of America Rocky Mountain Section Annual Meeting, Pueblo, CO.
- Romagnano, L., Gilmore, D., Evans, B., Loats, J. T., Soto-Johnson, H., Chamberlin, M. T., & Powers, R. (2007, April). *The pedagogical preparation of prospective mathematics teachers*. Mathematical Association of America Rocky Mountain Section Annual Meeting, Pueblo, CO.
- Powers, R., & Allison, D. (2007, April). *A study of the use of the TI-92 in discrete mathematics*. Mathematical Association of America Rocky Mountain Section Annual Meeting, Pueblo, CO.
- Novak, J., & Powers, R. (2006, September). *Modeling number operation on the number line with the Do-Math bear*. Paper presented at the Colorado Council of Teachers of Mathematics 2006 Conference, Denver, CO.
- Powers, R., Bromley, W., Larson, P., Greene, M., & Capps, P. (2005, April). *Developing algebraic thinking: A journey from pre-school to college*. A MAA-CCTM joint panel discussion at the Rocky Mountain Section of the Mathematical Association of America, Greeley, CO.
- Powers, R. A. (2005, February). *Mathematics education reform: Factors affecting practices in high school algebra*. Paper presented at University of Montana, Missoula, MT.
- Chamberlin, M., & Powers, R. (2004, November). *Aluminum bats: A context for geometry and measurement*. Paper presented at the Colorado Council of Teachers of Mathematics 2004 Conference, Denver, CO.
- Powers, R. A. (2002, October). *Mayan and Martian numbers: Exploring alternative number systems*. Paper presented at the Colorado Council of Teachers of Mathematics 2002 Conference, Denver, CO.
- Powers, R. A. (2002, February). *Standards practices: Factors affecting their implementation in high school algebra*. Paper presented at Winona State University, Winona, MN.
- Powers, R. A. (2002, January). *Factors affecting the implementation of standards practices in high school algebra*. Paper presented Colorado State University, Fort Collins, CO.

#### FUNDED PROJECTS:

- Oehrtman, M., Novak, J., Parker, C. F., & Powers, R. (2015, September). *Collaborative Research: Initiating a Foundational Research Model for Secondary Mathematical Knowledge for Teaching (INFORMS MKT)*, \$1,166,640. National Science Foundation: Education & Human Resources Core Research (ECR).
- Setter, K., Dalke, J., Powers, R., Harding, J., Bollinger, A. (July, 2015). *NW BOCES and Hayden School District MSP SUMMIT, Third-Year Continuation*. \$493,006, Colorado Department of Education.
- Setter, K., Dalke, J., Powers, R., Harding-Dekam, J., Bollinger, A. (May, 2014). *NW BOCES and Hayden School District MSP SUMMIT*. \$854,252, Colorado Department of Education.
- Powers, R. A. (March 2014). *Assessing the Learning Trajectories of Exponential Functions (ALT-EF)*. \$3000, Office of Sponsored Programs.



- Powers, R. A., & Novak, J. D. (March 2012). *Grant-writing Incentive Program (GRIP) Proposal*. \$2000, College of Natural and Health Sciences.
- Novak, J.D. & Powers, R. A. (March 2012). *Summer Support Initiative (SSI) for Research, Scholarship, Creative works, and Grant Writing*. \$3000, Office of Sponsored Programs.
- Novak, J., Mayes, R., Christiansen, M., Hauk, S., Powers, R., & Shader, B. (January 2009 – June 2015). *Mathematics Teacher Leadership Center*. Math and Science Partnership (MSP), \$4,999,744, National Science Foundation (NSF # 0832026).
- Powers, R. A. (January 2008 – August 2008). *Teaching and Learning of Calculus with a Wireless Handheld Network*. Faculty Research and Publication Board Award, \$2500, SPARC.
- Powers, R. A. (August 2007 – May 2008). *Teaching and Learning of Algebra with a Wireless Handheld Network*. Research Incentive Fund Award, \$2600, SPARC.
- Powers, R. A. & Champion, J. (June 2007 – August 2007). *Summer Graduate Research Assistant Application for Joe Champion*. AVP for Research and Dean of the Graduate School
- Powers, R. A. (January 2004 – January 2005). *Needs Assessment of the Secondary Mathematics Teacher Continuum*. Research Development Award, \$2000, SPARC.

**PROPOSALS SUBMITTED:**

- Novak, J., Bartell, T., Parker, C. F., Powers, R., & Klopfenstein, K. (2013, September). *Toward*

professional development of middle school teachers for two levels: 7<sup>th</sup> and 8<sup>th</sup>  
Grades

PROFESSIONAL CONSULTATION:

Advanced Placement Consultant

Summer 2011, AP Statistics Reader, Daytona Beach, FL

Summer 2009, AP Statistics Reader, Louisville, KY.

Invited Panelist

2013, STEM Teacher Preparation Symposium, University of Northern Colorado, Greeley, CO.

Invited Writer

2006, Instructors guide to *Geometric Structures for Elementary Teachers*, Oklahoma State University, Stillwater, OK.

Conference Proposal Reviewer

*Association of Mathematics Teacher Educators Annual Conference*

2015 Reviewed 40 submissions from Development of Mathematics Teacher Educators, Pedagogical Content Knowledge, and Teaching and Learning with Technology and made final recommendations for 19 submission in Development of Mathematics Teacher Educators as a member of the AMTE Program Committee

2014 Reviewed 40 submissions and made final recommendations for 53 submissions in

2013 present, Reviewer of article submissions, *Journal for Research in Mathematics Education*  
"Self-explanation training improves proof comprehension"

2006 present, Reviewer of article submissions, *School Science and Mathematics*  
How Much do Mathematics Skills Improve w

Investigating Real-Life Contexts in Textbooks for the Teaching of  
One-Variable Linear Equations

Promoting Pre-

Mathematics Conceptually Through KTEM

omputation: A Case of

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Leadership:  
2008 2012

- Summer 2008 April Judd, *Function, Visualization, and Mathematical Thinking for College Students with Attention Deficit Hyperactivity Disorder*. Committee Member.
- Summer 2008 Allison Toney, *Women with Advanced Degrees in Mathematics in Doctoral Programs in Mathematics Education*, Committee Member.
- Spring 2007 Clark Dollard,

Stephanie Crossley, *Increasing Students Cognitive Demands through  
Mathematical Tasks*



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Summer 2010 MED 550 Applied Probability and Statistics, Mathematical Sciences  
Spring 2010 MED 543 Teaching Geometry, Mathematical Sciences



MED 441 Methods of Teaching Mathematics, Mathematical Sciences  
STEP 161/262/363 Observation and Analysis of Student Teaching, Educational  
Foundations & Curriculum Studies

Spring 2005

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- Fall 2004: MATH 387 *Topics in Fundamental Mathematics: Geometry for Elementary Teachers*  
Summer 2004: MED 441 *Models of Teaching Mathematics*  
Spring 2002: MATH 181 *Fundamentals of Mathematics I*

### Courses Developed

- Spring 2016 MED 341 Principles of Teaching Mathematics  
Fall 2007 MFT 522 Principles and Standards in Middle School Mathematics Teaching  
Fall 2004 MED 599 Action Research Project  
Fall 2001 MED 381 Fundamental Mathematics Education Lab (with Dr. Helen Gerretson)

## PROFESSIONAL DEVELOPMENT ACTIVITIES:

### Workshops, Clinics, Symposia, Conferences:

- February, 2013, 65th Annual Conference of the American Association of Colleges for Teacher Education, Orlando, FL.  
August, 2012, Secondary Math Lab, Ann Arbor, MI: University of Michigan.  
October, 2011, CBMS Forum on Teaching Teachers in the Era of the Common Core, Reston VA: Conference Board of the Mathematical Sciences  
September, 2011, 3rd International Realistic Mathematics Education Conference, Boulder, CO: University of Colorado School of Education and the Freudenthal Institute USA  
August, 2011, Secondary Math Lab, Ann Arbor, MI: University of Michigan.  
May, 2007, TI-Graphing Calculator and Navigator Conference, Littleton, CO: Texas Instruments and Littleton Public Schools.  
February, 2007, Center for the Study of Mathematics Curriculum K-12 Mathematics Conference, Arlington, VA: Centers for Learning and Teaching Network (CLTNet) Elluminate webcast .  
September, 2006, Accreditation, Accountability and Quality, Arlington, VA: NCATE/AACTE.  
September, 2005, Mathematics Professional Development Leadership Institute, Denver, CO: WestEd.  
June, 2005, GeoSET Workshop, Stillwater, OK: Oklahoma State University.  
January, 2004, How to Write the Application Narrative, Greeley, CO: Management Concepts.  
September, 2003, Grants Resource Center Fall Meeting, Washington, DC: Grants Resource Center.  
April, 2003, Grant Writing Workshop, Greeley, CO: SPARC.

## HONORS AND AWARDS:

- 2008 Scholar in Residence of the Center for the Enhancement of Teaching and Learning  
2008 Excellence in Teaching, College of Natural and Health Sciences of the University of Northern Colorado  
2007 ET 19BDC BT1 0TJET(e)4(r 160.46i Tm[(2001)] TJhy)30(n0(j TJETBT1 ,8y)5(prB)7(oulsETd

College  
1994 Faculty Advisor Award, Phi Theta Kappa Honor Society, Front Range Community  
College