

VITA
Chandra Hawley Orrill

HIGHER EDUCATION

A. Degrees

- Ph.D.: Instructional Systems Technology, Indiana University
Attended: Summer 1994 - December 1999. Degree conferred: December 1999.
Dissertation Title: *Building technology-based, learner-centered environments: Professional development in real time* (Major Advisor: Thomas Duffy)
- M.S.: Instructional Systems Technology, Indiana University
Attended: Summer 1994 - December 1999. Degree conferred: December 1996.
- B.A.: The New College, magna cum laude, The University of Alabama, May 1993
Depth Study: Computer Applications in Music

WORK HISTORY

Executive Director of Research & Development: ReThink Learning Labs (June 2023 –)

- Oversee creative endeavors of ReThink Learning Labs including research, design, and development efforts
- Development of grant projects
- Grant writing and support
- Conduct all phases of educational research
- Conduct and design professional development for teachers

Faculty: University of Massachusetts Dartmouth

Professor, Mathematics Education (August 2018 – May 2023)

Associate Professor, Mathematics Education (July 2013 – August 2018)

Assistant Professor, Mathematics Education (January 2010 – July 2013)

Director, Kaput Center for Research & Innovation in STEM Education (July 2017 – June 2020, Sept 2021 – May 2023)

Key accomplishments as Director

- Created a Grants Support Specialist Position to support PIs
- Moved the Kaput Center to campus to help create more community involvement
- Partnered with Eduscape to bring key technologies and STEM ideas to the SouthCoast
- Increased local outreach while maintaining research focus
- Expanded STEM4Girls from ~100 to over 200 girls each year
- Founded and served as a “Champion” for a CoderDojo

Chair, Department of STEM Education and Teacher Development and Graduate Program Director for MAT Programs – STEM Education & Teacher Development (July 2013 – June 2017)

Key accomplishments as Chair and GPD

- Oversaw merger of two departments and led efforts to stabilize as a single department including revisiting a variety of policies
- Led redesign of MAT program leading to Initial Licensure and MAT program leading to Professional Licensure

- Collaborated with local school district to create a teacher preparation partnership
- Successfully hired several key faculty members (tenured, tenure track, and lecturer) and successfully overseeing the promotion of three faculty (2 to Full Professor and 1 to Associate Professor with tenure)
- Led development of MAT student handbook and program checklists to help make the MAT program logistics more accessible to students
- Created the Teacher Education Advisory Board comprised of key district and school partners

Graduate Program Director for Mathematics Education Ph.D. Program (2011-2013)

Adjunct Assistant Professor: Mathematics & Science Education
University of Georgia (July 2009 – 2013)

Adjunct Assistant Professor: Educational Psychology & Instructional Technology University of Georgia (June 2003 – 2013)

Assistant Professor: Instructional Technology – Educational Studies
Ohio University (September 1999 – August 2000)

B. Additional

Interim Administrative Director: Kaput Center for Research and Innovation in STEM Education. University of Massachusetts Dartmouth (July 2014 – June 2017)

Research Scientist: Kaput Center for Research and Innovation in STEM Education
University of Massachusetts Dartmouth (January 2010 – May 2023)

Associate Research Scientist: Learning and Performance Support Laboratory
University of Georgia (July 2006 – January 2010)

Assistant Research Scientist: Learning and Performance Support Laboratory
University of Georgia (September 2000 – July 2006)

GRANTS & CONTRACTS RECEIVED

Grants & Contracts Total: \$13,052,394

Grants & Contracts as Principal Investigator: \$7,358,129

a. Multiple Investigators (* indicates Research-focused grant)

* Rational Numbers Playground: Applying and Refining a Model for Dynamic, Discussion-Based PD for Fractions, Ratios, and Proportions. National Science Foundation. (**PI** with Co-PIs Rachael Brown, Penn State Abington & Allan Cohen, University of Georgia). Augusta 1, 2022 – July 31, 2026. Amount requested \$1,712,210. Status: Funded 4/25/22.

* EAGER: SaTC AI-Cybersecurity – Opening Doors for Cybersecurity & AI: An Interdisciplinary Approach to Engaging Middle School Students. National Science Foundation. (**PI** with Co-PIs Shakhnoza Kayumova & Pratim Sengupta, Univ. of Calgary). September 2021 – August 2023. Amount requested \$299,481.

* Computational Thinking Counts in Elementary Grades: Powerful STEM Teaching and Learning for the 21st Century. (**PI** with Co-PIs Shakhnoza Kayumova and Ramprasad Balasubramanian). National Science Foundation. December 2019 – November 2023. \$2,116,313.

- * Advancing Middle School Teachers' Understanding of Proportional Reasoning for Teaching (**Co-PI** on grant/PI on UMass Dartmouth Subaward. PI is Yasemin Copur-Gencturk at Univ of Southern California). Institute of Educational Sciences. July 2018 - June 2022. Total award: \$1,399,982. UMass Dartmouth Subaward: \$237,413.
- *Usable Measures of Teacher Understanding: Exploring Diagnostic Models and Topic Analysis as Tools for Assessing Proportional Reasoning for Teaching (**Co-PI** on grant/PI on UMass Dartmouth Subaward. PI is Yasemin Copur-Gencturk at Univ of Southern California). National Science Foundation. September 2018 - August 2022. Total Award: \$2,168,584. UMass Dartmouth subaward: \$377,973.
- Dartmouth High School Professional Development. Dartmouth Public Schools. December 2016 – June 2017. \$7,176 (Contract) (**PI** with Walter Stroup).
- *Diagnosing Teachers' Multiplicative Reasoning – National Science Foundation – DRK-12 program. October, 2008 – September, 2013. \$944,163 (PI: Andrew Izsák. **Co-PI** with Allan Cohen, Joanne Lobato, & Jonathan Templin)
- Building a Technology Research Agenda – An Early Career Symposium. August, 2008 – August, 2009. National Science Foundation. \$31,712. (**PI** with Co-PI Michael Hannafin.)
- Building a Shared Vision of Standards-based Mathematics Teaching: Franklin County K-5. Georgia's Improving Teacher Quality Grants Program. July, 2008 – June, 2009. \$44,926. (**PI** with Co-PI Dorothy White)
- Morgan County Mathematics. Contract with Morgan County Board of Education. August, 2007 – June, 2008. \$48,296. (**PI** with Co-PI Andrew Izsák)
- The Dragon Connection. Georgia Math and Science Partnership. July 2007 – June, 2009. UGA subaward on Jefferson City Schools Grant \$52,938. (**PI** on UGA subaward.)
- Fostering Research: A Colloquium for Technology Researchers. National Science Foundation. \$20,199 (**Co-PI** with PI: Mike Hannafin)
- *Does it Work? Building Methods for Understanding Effects of Professional Development. National Science Foundation – REESE program. January, 2007-December, 2010. \$999,958. (**PI**, with Co-PIs Allan Cohen & Andrew Izsák).
- Wilkes County Math & Science Partnership. Georgia Math and Science Partnership. August, 2006 – July, 2007. UGA subaward on Wilkes County Grant \$23,274. (**PI** on UGA subaward.)
- Jefferson City Math & Science Partnership. Georgia Math and Science Partnership. August, 2006 – July, 2007. UGA subaward on Jefferson City Schools Award \$19,094. (**PI** on UGA subaward.)
- RESA GPS Collaborative Professional Development Project. Funded through a subaward on an NSF Mathematics and Science Partnership Grant to the Georgia Board of Regents. August, 2005 – September, 2008. \$607,338. (**PI** on UGA subaward, with Co-PIs Tom Koballa (2006-2008) & Art Recesso (2005-2006).
- Technology Integration in Mathematics – Richmond County. Georgia's Improving Teacher Quality Grants Program. May, 2005 – May, 2006. \$52,623. (**PI**).
- Richmond County Board of Education Partnership. Georgia Math and Science Partnership. September, 2004 – May, 2007. UGA subaward on Richmond County award \$87,469. (**PI** on UGA subaward.)
- eMath: Title IId Enhancing Education through Technology. June, 2004 – September, 2006. \$45,000. (**PI** on contract through Georgia Department of Education.)

ALPS: All Learners are Problem Solvers. Georgia's Improving Teacher Quality Grants Program. May, 2004 – May, 2005. \$59,872. **(PI**, with Co-PI Denise Mewborn).

Technology Integration in Mathematics. Georgia's Improving Teacher Quality Grants Program. May, 2003 – May, 2004. \$76,424. **(PI**, with Co-PI Art Recesso.)

EisenSWET (Eisenhower – Scientific Workings of Everyday Things). Georgia's Eisenhower Higher Education Program, May, 2002 – May, 2003. \$23,524. **(Co-PI** with J. Steve Oliver.)

*Coordinating Student and Teacher Algebraic Reasoning (CoSTAR). National Science Foundation – ROLE program. January, 2003-December, 2007. \$1.1 million (PI: Andrew Izsák. **Co-PI** with Bradford Findell and John Olive.)

Learning to Teach with Technology Studio. U.S. Department of Education, July, 2001 – August, 2004. UGA Subaward: \$104, 500. **(PI** on UGA Subaward. Grant PI was Thomas Duffy, Indiana University).

Exploring Math: Primary grade math through technology and investigations. Eisenhower Higher Education, March, 2001-May, 2002, \$57,364. **(Project Director** with PI Michael Hannafin).

b. Individual (* indicates Research-focused grant)

Nauset Public Schools and SUNBURST Program. June 2020 – July 2020. \$12,440.76. (contract) **(PI)**

* Proportions Playground: A Dynamic World to Support Teachers' Proportional Reasoning. National Science Foundation – DRK-12 program. September 2016 – December 2018. \$725,962. **(PI)**

*CAREER: Coherence as a Basis for Understanding Teachers' Mathematical Knowledge. National Science Foundation – CAREER program. April 2011 – March 2016. \$601,492. **(PI)**

Building a Shared Vision of Standards-based Mathematics Teaching: Franklin County Middle and High School. Georgia's Improving Teacher Quality Grants Program. July, 2008 – June, 2009. \$54,657. **(PI)**

Exploring Standards-Based Mathematics 3-5 – Franklin County. Georgia's Improving Teacher Quality Grants Program. August, 2007 - May, 2008. \$34,500. **(PI)**

Exploring Standards-Based Mathematics 6-8 – Franklin County. Georgia's Improving Teacher Quality Grants Program. August, 2007 - May, 2008. \$35,787. **(PI)**

Deeper Explorations in Mathematics – Geometry (Richmond County). Georgia's Improving Teacher Quality Grants Program. August, 2007 - May, 2008. \$44,346. **(PI)**

Deeper Explorations of Mathematics – Richmond County & Exploring Math – Richmond County. Georgia's Improving Teacher Quality Grants Program. June 2006 – June, 2007. Combined total \$157,352. **(PI)**

Madison County Mathematics Improvement with Technology. Georgia's Improving Teacher Quality Grants Program. May, 2004 – May, 2005. \$32,697. **(PI)**

Understanding Mathematics Reform from the Teachers' Perspective. OVPR – University of Georgia, January – December, 2002, \$7,842. **(PI)**

C.

ACADEMIC AND PROFESSIONAL HONORS

JLS Reviewer of the Year for 2021, Journal of the Learning Sciences.

National Science Foundation Faculty Early Career Development Award. CAREER: Coherence as a Basis for Understanding Teachers' Mathematical Knowledge for Teaching (Award Number DRL-1054170). The CAREER grant is NSF's "most prestigious honor" for faculty early in their career.

Member of the Design-Based Research Collective funded by the Spencer Foundation through an Advanced Studies Institute grant (2001-02). Other participants included Christopher Hoadley (PI), William Sandoval (Co-PI), Eric Baumgartner, Philip Bell, Sean Brophy, Sherry Hsi, Diana Joseph, Sadhana Puntambekar, and Iris Tabak. <http://www.DesignBasedResearch.org/>

Young Researcher Award (2000), Association for Educational Communications and Technology.

University Fellowship (1994-1996), Indiana University

Division of Instructional Development Convention Intern (1997), Association for Educational Communications & Technology Annual Meeting, Albuquerque, NM

PUBLICATIONS

Peer Reviewed Publications (underlining indicates student being mentored on paper)

Epstein, M. L., Malik, H., Wang, K., & Orrill, C. H. (accepted). Unpacking response process issues encountered when developing a mathematics teachers' pedagogical content knowledge. *Investigations in Mathematics Learning*. (Contribution 20%)

Orrill, C. H., & Brown, R. E. (2023). Using design-based research to develop a professional development model. In J. M. Spector, B. B. Lockee, & M. D. Childress (Eds.), *Learning, design, and technology: An international compendium of theory, research, practice, and policy*. Springer. https://doi.org/10.1007/978-3-319-17727-4_177-1 (Contribution 60%)

Orrill, C. H., Gearity, Z., & Wang, K. (in press). Continuing evolution of research on teaching & learning: Exploring emerging methods for unpacking research on teachers, teaching, and learning. In A. Manizade, N. Buchholtz, & K. Beswick (Eds.), *The evolution of research on teaching mathematics: International perspectives in the digital era*. Springer. (Contribution 50%)

Nagar, G. G., Hegedus, S., & Orrill, C. H. (2022). High school teachers' discernment of invariant properties in a dynamic geometry environment. *Educational Studies in Mathematics*, 111(1), 127-145. <https://doi.org/10.1007/s10649-022-10144-6> (Contribution 15%)

Nagar, G.G., Hegedus, S., & Orrill, C. H. (2022). Teachers' understanding of draggable geometric objects: Variance and invariance in a dynamic geometry environment. *Digital Experiences in Mathematics Education*, 8(3), 259-286. (Contribution 15%)

Orrill, C. H., & Millett, J. (2021). Teachers' abilities to make sense of variable parts reasoning. *Mathematical Thinking and Learning*, 23(3), 254-270. <https://doi.org/10.1080/10986065.2020.1795567> (Contribution 50%)

Weiland, T., Orrill, C. H., Nagar, G. G., Brown, R. E., & Burke, J. (2021). Framing a robust understanding of proportional reasoning for teachers. *Journal of Mathematics Teacher Education*, 24, 179-202. <https://doi.org/10.1007/s10857-019-09453-0> (Contribution 20%)

Brown, R. E., Orrill, C. H., & Park, J. (2020). Differences in knowledge used by practicing teachers in a dynamic versus static proportional task. *Mathematics Education Research Journal*. <https://doi.org/10.1007/s13394-020-00350-x> (Contribution 30%)

Brown, R. E., Epstein, M. L., & Orrill, C. H. (2020). When constant in a proportional relationship isn't constant – A sign of not-so-shared understanding. *Investigations in Mathematics Learning*, 12(3), 194-207. <https://doi.org/10.1080/19477503.2020.1772035> (Contribution 25%)

- Orrill, C. H., Copur-Gencturk, Y., Cohen, A., & Templin, J. (2020). Revisiting purpose and conceptualization in the design of assessments for teachers of mathematics. *Research in Mathematics Education*, 22(2), 209-224. <https://doi.org/10.1080/14794802.2019.1702893> (Contribution 40%)
- Brown, R. E., Weiland, T., & Orrill, C. H. (2020). Mathematics teachers' use of knowledge resources when identifying proportional situations. *International Journal of Science and Mathematics Education*, 18, 1085-1104. <https://doi.org/10.1007/s10763-019-10006-3> (Contribution 30%)
- Weiland, T., Orrill, C. H., Brown, R. E., & Nagar, G. G. (2019). Mathematics teachers' ability to identify situations appropriate for proportional reasoning. *Research in Mathematics Education*, 21(3), 233-250. doi: 10.1080/14794802.2019.1579668 (Contribution 30%)
- Jacobson, E., Lobato, J., & Orrill, C. H. (2018). Middle school teachers' use of mathematics to make sense of student solutions to proportional reasoning problems. *International Journal of Science and Mathematics Education*, 16(8), 1541-1559. doi: 10.1007/s10763-017-9845-z (Contribution 25%)
- deAraujo, Z., Orrill, C. H., & Erikson, J. (2018). Designing communication-rich problem-centered mathematics professional development. *International Journal of Mathematical Education in Science and Technology*, 49(3), 323-340. doi: 10.1080/0020739X.2017.1373153 (Contribution 40%)
- Orrill, C. H. (2016). The process is just messy: A historical perspective on the adoption of innovations. *The Mathematics Educator*, 25, 71-94. Available: <http://tme.journals.libs.uga.edu/index.php/tme/article/view/352/284>
- Orrill, C. H., & Cohen, A. (2016). Purpose and conceptualization: Examining assessment development questions through analysis of measures of teacher knowledge. In A. Izsák, J. T. Remillard, & J. Templin (Eds.), *Psychometric methods in mathematics education: Opportunities, challenges, and interdisciplinary collaborations* (pp. 139–153). *Journal for Research in Mathematics Education* Monograph Series No. 15. Reston, VA: National Council of Teachers of Mathematics. (Contribution 70%)
- Tatsuoka, C., Clements, D. H., Sarama, J., Izsák, A., Orrill, C. H., de la Torre, J., ... Tatsuoka, K. K. (2016). Developing workable attributes for psychometric models based on the Q-matrix. In A. Izsák, J. T. Remillard, & J. Templin (Eds.), *Psychometric methods in mathematics education: Opportunities, challenges, and interdisciplinary collaborations* (pp. 73–96). *Journal for Research in Mathematics Education* Monograph Series No. 15. Reston, VA: National Council of Teachers of Mathematics. (Contribution 10%)
- Orrill, C. H., & Polly, D. (2016). Developing teachers' TPACK for mathematics through professional development: The case of InterMath. In M. Niess, S. Driskell, & K. Hollebrands (Eds.), *Handbook of research on transforming mathematics teacher education in the digital age* (pp. 443-462). Hershey, PA: IGI Global. (Contribution 60%)
- Polly, D., & Orrill, C. H. (2016). Designing professional development to support teachers' TPACK in elementary school mathematics. In M. Herring, M. J. Koehler, & P. Mishra (Eds.), *Handbook of technological pedagogical content knowledge* (2nd ed., pp. 259-269). New York: Routledge. (Contribution 50%)
- Orrill, C. H., & Cohen, A. (2016). Why defining the construct matters: An examination of teacher knowledge using different lenses on one assessment. *The Mathematics Enthusiast*, 13(1&2), 93-110. (Contribution 70%)

- Orrill, C. H., Kim, O.-K., Peters, S. A., Lischka, A. E., Jong, C., Sanchez, W. G., & Eli, J. A. (2015). Challenges and strategies for assessing mathematical knowledge for teaching. *Mathematics Teacher Education and Development*, 17(1), 12-29. (Contribution 25%)
- Zhang, D., Orrill, C. H., & Campbell, T. (2015). Using the mixture Rasch model to explore knowledge resources students invoke in mathematics and science assessments. *School Science and Mathematics*, 115(7), 356-365. DOI: 10.1111/ssm.12135 (Contribution 30%).
- Orrill, C. H., & Kittleson, J. (2015). Translating learning into practice: Considering the relationship between teachers' professional development and teaching. *Journal of Mathematics Teacher Education*, 18(3), 273-297. doi: 10.1007/s10857-014-9284-5 (Contribution 60%).
- Kwon, N. Y., & Orrill, C. H. (2015). Reflection as professional knowledge for mathematics teachers. *Journal of the Korea Society of Mathematical Education Series D: Research in Mathematical Education*, 19(1), 1-17. (Contribution 30%)
- Orrill, C. H., & Polly, D. (2013). Supporting mathematical communication through technology. In D. Polly (Ed.), *Common core mathematics standards and implementing digital technologies* (pp. 22-36). Hershey, PA: IGI Global. (Contributed 60%)
- Erbas, A. K., Ledford, S., Orrill, C. H., & Polly, D. (2013). Supporting pattern exploration and algebraic reasoning. In D. Polly (Ed.), *Common core mathematics standards and implementing digital technologies* (pp. 226-231). Hershey, PA: IGI Global. (Contributed 15%)
- Orrill, C. H. (2013). Connection making: Capitalizing on the affordances of dynamic representations through mathematically relevant questioning. In S. Hegedus & J. Roschelle (Eds.), *Democratizing access to important mathematics through dynamic representations: Contributions and visions from the SimCalc research program* (pp 285-298). New York: Springer.
- Orrill, C. H., & Brown, R. E. (2012). Making sense of double number lines in professional development: Exploring teachers' understandings of proportional relationships. *Journal of Mathematics Teacher Education*, 15(5), 381-403. DOI: 10.1007/s10857-012-9218-z (Contribution 75%)
- Orrill, C. H., Brown, R. E., Li, F., & Geisler, S. K. (2012). Questioning teacher goals in professional development: Shaping satisfaction perceptions, and performance. In B. Boufoy-Bastick (Ed.), *Cultures of professional development for teaching: Collaboration, reflection, management and policy* (pp. 573-600). Strasbourg, France: Analytrics. (Contribution 30%)
- Izsák, A., Jacobson, E., de Araujo, Z., & Orrill, C. H. (2012). Measuring growth in mathematical knowledge for teaching fractions with drawn quantities. *Journal for Research in Mathematics Education*, 43(4), 391-427. (Contribution 25%; top journal in field)
- Polly, D., & Orrill, C. (2012). Developing technological pedagogical and content knowledge (TPACK) through professional development focused on technology-rich mathematics tasks. *Meridian*, 15. Available: <http://ced.ncsu.edu/meridian/index.php/meridian/article/view/44> (Contribution 20%)
- Orrill, C. H., & Polly, D. (2012). Technology integration in mathematics: A model for integrating technology through content development. In D. Polly, K. Persichitte, & C. Mims (Eds.), *Developing technology-rich teacher education programs: Key issues* (pp. 337-356). Hershey, PA: Information Science Reference (an imprint of IGI Global). doi:10.4018/978-1-46660-014-0 (Contribution 70%)
- Lee, S., Brown, R. E., & Orrill, C. H. (2011). Mathematics teachers' reasoning about fractions and decimals using drawn representations. *Mathematical Thinking and Learning*, 13(3), 198-220. (Contribution 50%)

- Izsák, A., Orrill, C. H., Cohen, A., & Brown, R. E. (2010). Measuring middle grades teachers' understanding of rational numbers with the mixture Rasch model. *Elementary School Journal*, 110(3), 279-300. (Contribution 25%)
- Kwon, N. Y., & Orrill, C. H. (2007). Understanding a teacher's reflection: A case study of a middle school mathematics teacher. *School Science and Mathematics*, 107(6), 246-257.
- Bleich, L., Ledford, S., Orrill, C. H., & Polly, D. (2006). An analysis of using graphical representations in participants' solutions. *The Mathematics Educator*, 16(1), 22-34.
- Orrill, C. H., & the InterMath Team (2006). What learner-centered professional development looks like: The pilot studies of the InterMath professional development project. *The Mathematics Educator*, 16(1), 4-13.
- Erbas, A. K., Ledford, S., Orrill, C. H., & Polly, D. (2005). Promoting problem solving across geometry and algebra by using technology. *Mathematics Teacher*, 98(9), p. 599-603.
- Hannafin, M., Orrill, C., Kim, H., & Kim, M. (2005). Educational technology research on postsecondary settings: Potential, performance, and prospects. *Journal of Computing in Higher Education*, 16(2), 3-22.
- Erbas, A. K., Ledford, S., Polly, D., & Orrill, C. H. (2004). Engaging students through technology: Using technology-enhanced investigations in the middle grades. *Mathematics Teaching in the Middle School*, 9(6), 300-305.
- Orrill, C. H. (2004). Guest Editorial...Do you need a Ph.D. to teach K-8 mathematics in ways respected by the mathematics education community? *The Mathematics Educator*, 14(1), 1-7.
- Design-Based Research Collective (2003). Design-based research: An emerging paradigm for educational inquiry. *Educational Researcher*, 32(1), 5-8.
- Orrill, C. H. (2002). Supporting online PBL: Design considerations for collaborative problem-solving communication tools. *Distance Education*, 23(1), 41-57.
- Orrill, C. H. (2001). Building learner-centered classrooms: A professional development framework for supporting critical thinking. *Educational Technology Research and Development*, 49(1), pp. 15-34. (Top journal in field)

Textbook

- Recesso, A. & Orrill, C. H. (2008). *Integrating technology into teaching: The technology & learning continuum*. New York: Houghton-Mifflin Company. (Contribution 50%)

Handbook Chapter

- Orrill, C. H., Hannafin, M. J., & Glazer, E. R. (2003). Research on and research with emerging technologies revisited: The role of disciplined inquiry in the study of technology innovation. In D. H. Jonassen (Ed.) *Handbook of research for educational communications and technology (2nd ed.)*. Mahwah, NJ: Erlbaum. (Contribution 60%)

Editorially Reviewed Publications

- Orrill, C. H., & Hill, J. R. (2019). Maya Thomas. In P. A. Ertmer, J. Quinn, & K. Glazewski (Eds.) *The ID casebook: Case studies in instructional design (5th ed.)* (pp. 57-63). New York: Routledge. (Significant rewrite from previous versions)

- Orrill, C. H. (2015). Formative assessment. In J. M. Spector (Ed.), *Encyclopedia of educational technology*. Thousand Oaks, CA: Sage Publications Ltd.
- Orrill, C. H. (2015). Foreword. In D. Polly (Ed.), *Cases on technology integration in mathematics education* (pp. xx-xxii). Hershey, PA: Information Science Reference.
- Orrill, C., & Hill, J. (2013). Maya Thomas. In P. A. Ertmer, J. Quinn, & K. Glazewski (Eds.) *The ID casebook: Case studies in instructional design* (4th ed.). Upper Saddle River, NJ: Merrill.
- Polly, D., & Orrill, C. (2012). The Common Core State Standards in mathematics: Examining the critical areas in grades 5 & 6. *Teaching Children Mathematics*, 18(9), 566-573. (Contribution 35%)
- Wise, A. F., Orrill, C. H., Duffy, T. M., del Valle, R., & Kirkley, J. R. (2008). When a peer group isn't needed: Effective online learning in an individual mentoring model. In L. Moller, D. Harvey, & J. Huett (Eds.), *Learning and instructional technologies for the 21st century: Visions of the future*. Springer Science+Business Media, LLC.
- Duffy, T., & Orrill, C. (2004). Constructivism. In A. Kovalchick & K. Dawson (Eds.) *Education and Technology: An Encyclopedia* (Vol. 1, 165-172). Santa Barbara, CA: ABC-CLIO.
- Orrill, C. (2004). Learner-centered environment (LCE). In A. Kovalchick & K. Dawson (Eds.) *Education and Technology: An Encyclopedia* (Vol. 2, 401-406). Santa Barbara, CA: ABC-CLIO.
- Orrill, C., & Hill, J. (2002). Maya Thomas. In P. A. Ertmer & J. Quinn (Eds.) *The ID casebook: Case studies in instructional design* (2nd ed.). Upper Saddle River, NJ: Merrill.
- Brown, S., Galloway, C., Orrill, C., & Umberger, S. (2002). Lead your students in mathematical discovery. *Learning & Leading with Technology* 29(5), 22-27, 64.
- Orrill, C. H. (2001). Learning objects to support inquiry-based, online learning. In D. A. Wiley (Ed.) *The instructional use of learning objects*. Bloomington, IN: Association for Educational Communications and Technology.
- Duffy, T. M., Dueber, B., & Hawley (Orrill), C. L. (1999). Critical thinking in a distributed environment: A pedagogical base for the design of conferencing systems. In C. J. Bonk & K. King (Eds.) *Electronic Collaborators: Researching the Discourse of Learner-Centered Technologies* (pp. 51-78). Hillsdale NJ: Lawrence Erlbaum & Associates.
- Hawley (Orrill), C. L. (1997). Snapshots of systemic change: A roadmap. *Educational Technology*, 37(6), 57-64.

*Published Proceedings of Presentations (*indicates peer reviewed)*

- * Epstein, M. L., Malik, H., Wang, K., & Orrill, C. H. (2022). Teacher-responses: Highlight characteristics of low response process validity for item(s) measure teachers' pedagogical content knowledge. In A. E. Lischka, E. B. Dyer, R. S. Jones, J. N. Lovett, J. Strayer, & S. Drown (Eds.), *Proceedings of the 44th annual meeting of the North American Chapter of the International Group for Psychology in Education* (pp. 671-675). Middle Tennessee State University.
- * Orrill, C. H., Brown, R. E., Thapa, R., & Nti-Asante, E. (2022). One teacher's knowledge of proportions in practice. In A. E. Lischka, E. B. Dyer, R. S. Jones, J. N. Lovett, J. Strayer, & S. Drown (Eds.), *Proceedings of the 44th annual meeting of the North American Chapter of the International Group for Psychology in Education* (pp. 684-688). Middle Tennessee State University.

- * Orrill, C. H., Brown, R. E., Thapa, R., & Nti-Asante, E. (2022). Adapting the knowledge quartet for non-didactic classrooms. In A. E. Lischka, E. B. Dyer, R. S. Jones, J. N. Lovett, J. Strayer, & S. Drown (Eds.), *Proceedings of the 44th annual meeting of the North American Chapter of the International Group for Psychology in Education* (pp. 743-744). Middle Tennessee State University.
- * Brown, R. E., & Orrill, C. H., (2021, October). Using proportional tasks to explore teachers' ability to make sense of student thinking. In Olanoff, D., Johnson, K., & Spitzer, S. (Eds), *Proceedings of the forty-third annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (pp. 419-426). Philadelphia, PA.
- * Nagar, G. G., Hegedus, S., & Orrill, C. H. (2021, October). A framework for analysis of variance and invariance in a dynamic geometry environment. In Olanoff, D., Johnson, K., & Spitzer, S. (Eds), *Proceedings of the forty-third annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (pp. 1749-1753). Philadelphia, PA.
- * Orrill, C. H., & Brown, R. E. (2021, October). Teachers' knowledge resources for solving proportions. In Olanoff, D., Johnson, K., & Spitzer, S. (Eds), *Proceedings of the forty-third annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (pp. 461-465). Philadelphia, PA.
- * Orrill, C. H., Epstein, M., Wang, K., Malik, H., & Copur-Gencturk, Y. (2021, October). Designing assessment items for measuring PCK for proportional reasoning. In Olanoff, D., Johnson, K., & Spitzer, S. (Eds), *Proceedings of the forty-third annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (pp. 492-493). Philadelphia, PA.
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- * Orrill, C. H., & Burke, J. P. (2013, November). Fine-grained analysis of teacher knowledge: Proportion and geometry. In M. V. Martinez & A. C. Superfine (Eds.), *Proceedings of the thirty-fifth annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (PME-NA 2013) (pp.605-612). Chicago: University of Chicago.
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CONFERENCE PRESENTATIONS (underline indicates student being mentored)

a. Invited Presentations & Panels

- Orrill, C. H., & Sailor, E. (2022, August). Computational thinking through STEM: Integrating CT into STEM Classrooms. Presented to the Interagency Working Group – Computational Literacy. Virtual.
- Orrill, C., & Sailor, E. (2022, June). Computational thinking through STEM: A scalable model for elementary classrooms. Presented at TIES STEM Ecosystem Convening. Bay City, MI.
- Orrill, C. H. (2022, June). Addressing the STEM gap [Panel member]. *SE MA STEM Network Addressing the STEM Gap and Wealth Inequalities Partnership – Programs – Practices*.

Virtual. (Organized by CONNECT).

- Orrill, C. (2021, August). Panels at *Urban and suburban community STEM/DEI models for making positive change*. Panelist as part of Southeastern MA STEM Network *Diversity, equity, inclusion (DEI) program 2021: Addressing DEI while advancing STEM education in education, in the workplace, in communities*. Virtual. (Organized by CONNECT)
- Orrill, C. (2020, December). *Playing in PD: Technology, talking, and tasks to support teachers' understanding of proportional situations*. Presented as part of Herman & Rasiej Mathematics Initiative Lectures in Mathematics Education. Los Angeles, CA (virtual).
https://www.youtube.com/watch?v=G1aqzikJa_w
- Orrill, C. H. (2019, November). *Playing in PD: Using educational technology to learn math*. Presented at 5th China Education Innovation Expo. Zhuhai, China.
- Orrill, C. H. (2019, April). Education panelist at *MassForward: A vision for the 2030 agenda*, Boston, MA.
- Orrill, C. H. (2015, May). *The changing face of teacher education*. Presented to Massachusetts Association of School Committees, Division 7: Cape, Islands, Bourne & Wareham.
- Orrill, C. H. (2013). *MathEd Podcast Episode 1301: Making sense of double number lines in professional development: Exploring teachers' understandings of proportional relationships* [podcast]. Retrieved from <http://mathed.podomatic.com/>
- Orrill, C. (2011, September). Measuring teacher knowledge. Presented as part of *Contemporary Issues in Mathematical Knowledge Workshop* at An Interdisciplinary Conference on Assessment in K-12 Mathematics: Collaborations Between Mathematics Education and Psychometrics, Atlanta, GA.
- Orrill, C. (2011, September). Mixture Rasch models for measuring teacher learning: The case of the Does it Work project. Presented as part of the *Grounding Applications of IRT* Panel at An Interdisciplinary Conference on Assessment in K-12 Mathematics: Collaborations Between Mathematics Education and Psychometrics, Atlanta, GA.
- Orrill, C. H. (2011, September). Thoughts on learning from researching teachers. Presented as part of *How People Learn – Implications for Motivation Research* Panel at ITEST Convening: Advancing Research on Youth Motivation in STEM, Boston, MA.
- Orrill, C. H. (2010, December). *Considering the relationship between professional development and practice*. Presented to University of Wisconsin Mathematics Education Graduate Seminar, Madison, WI.
- Orrill, C. H. (2009, April). *Assessing teachers' knowledge in mathematics: Considering new approaches*. Invited presentation to The International Center for Learning, Education and Performance Systems, Athens, GA.

b. Works Presented

International, National & State Conferences

- Zhao, Y., Liu, Z., Orrill, C., Kayumova, S., & Balasubramanian, R. (2023, July). Designing professional learning workshop for shaping teachers' learning pedagogical content knowledge in computational thinking [Poster]. *ICLS conference at the ISLS Annual Meeting*. Montreal.
- Asif, A. D., Malik, H., Orrill, C. H., Balasubramanian, R., & Kayumova, S. (2023, April). An exploratory study: understanding teachers' use of decomposition [Conference presentation]. *National Association of Research in Science Teaching (NARST) 2023*. Chicago, IL.

- Brown, R. E., Thapa, R., & Orrill, C. H. (2023, April). Adapting the Knowledge Quartet to explore teacher practices in the United States [Conference presentation]. *AERA Annual Meeting 2023*. Chicago.
- Epstein, M., Malik, H., Wang, K., Orrill, C. H., & Copur-Gencturk, Y. (April, 2023). Teachers' reflections in an intelligent, adaptive professional development program for proportional reasoning [Roundtable presentation]. *AERA Annual Meeting 2023*. Chicago.
- Kayumova, S., Asif, A. D., Richard, E., Orrill, C. H., Liu, Z., Gearty, Z., Thapa, R., Tasnim, N., & Balasubramanian, R. (2023, April). Exploring elementary teachers' eagerness and reluctance to integrating computational thinking [Roundtable presentation]. *AERA Annual Meeting 2023*. Chicago.
- Epstein, M. L., Malik, H., Wang, K., & Orrill, C. H. (2022, November). Teacher-responses: Highlight characteristics of low response process validity for item(s) measure teachers' pedagogical content knowledge [Conference paper]. *44th annual meeting of the North American Chapter of the International Group for Psychology in Education*. Nashville.
- Orrill, C. H., Brown, R. E., Thapa, R., & Nti-Asante, E. (2022, November). One teacher's knowledge of proportions in practice [Conference paper]. *44th annual meeting of the North American Chapter of the International Group for Psychology in Education*. Nashville.
- Orrill, C. H., Brown, R. E., Thapa, R., & Nti-Asante, E. (2022, November). Adapting the knowledge quartet for non-didactic classrooms [Poster presentation]. *44th annual meeting of the North American Chapter of the International Group for Psychology in Education*. Nashville.
- Orrill, C. H., & Brown, R. E. (2022, October). *Mathematics teachers' knowledge for teaching proportions: Using two frameworks to understand knowledge in action* [Conference paper]. International Conference on Quantitative Ethnography 2022, Copenhagen.
- Brown, R. E., & Orrill, C. H., (2021, October). Using proportional tasks to explore teachers' ability to make sense of student thinking. Paper presented at the *Forty-third annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education*. Philadelphia, PA.
- Nagar, G. G., Hegedus, S., & Orrill, C. H. (2021, October). A framework for analysis of variance and invariance in a dynamic geometry environment. Paper presented at the *Forty-third annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education*. Philadelphia, PA.
- Orrill, C. H., & Brown, R. E. (2021, October). Teachers' knowledge resources for solving proportions. Paper presented at the *Forty-third annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education*. Philadelphia, PA.
- Orrill, C. H., Epstein, M., Wang, K., Malik, H., & Copur-Gencturk, Y. (2021, October). Designing assessment items for measuring PCK for proportional reasoning. In Olanoff, D., Johnson, K., & Spitzer, S. (Eds), *Proceedings of the forty-third annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (pp. 492-493). Philadelphia, PA.
- Burke, J. P., Orrill, C. H., Malik, H., Harper, A., Epstein, M. & Brown, R. E. (2020, Apr 17 - 21) *Quantity: Challenging the assumption of a shared definition* [Roundtable Session]. AERA Annual Meeting San Francisco, CA <http://tinyurl.com/w68lyc6> (Conference Canceled)
- Nagar, G. G., Orrill, C. H. & Hegedus, S. J. (2020, Apr 17 - 21) *Teachers' discernment of invariant properties in a dynamic geometry environment* [Poster Session]. AERA Annual Meeting San Francisco, CA <http://tinyurl.com/srh4ne5> (Conference Canceled)

- Nagar, G. G., Orrill, C. H. & Hegedus, S. J. (2020, Apr 17 - 21) *Teachers' conceptualization of and reasoning about draggable objects in a dynamic Geometry environment* [Poster Session]. AERA Annual Meeting San Francisco, CA <http://tinyurl.com/uu3lrfo> (Conference Canceled)
- Orrill, C., Olanoff, D., Boston, M., Brown, R. E., Burke, J. P., Tobias, J. M., Feldman, Z., Bajwa, N. P., Thanheiser, E., & Welder, R. M. (2020, February). *Tasks for teachers: Approaches to the design of tasks for preservice and inservice learners*. Symposium presented at Association of Mathematics Teacher Educators 24th Annual AMTE Conference. Phoenix, AZ.
- Orrill, C. H. (2019, July). *Playing in PD: A technology-based approach to learning proportions*. Workshop presented at EDInnovateLive 2019. San Diego, CA.
- Brown, R. E., & Orrill, C. H. (2019, November). An exploration of teachers' abilities to identify proportional situations and make sense of students' thinking. Brief research report presented at PME-NA⁴¹: 41st Annual Conference of the North American Chapter of the International Group for the Psychology of Mathematics Education. St. Louis, MO.
- Nagar, G. G., Orrill, C. H., & Hegedus, S. (2019, November). High school mathematics teachers' discernment of variance and invariance in a dynamic geometry environment. Brief Research Report to be presented at PME-NA⁴¹: 41st Annual Conference of the North American Chapter of the International Group for the Psychology of Mathematics Education. St. Louis, MO.
- Orrill, C. H., Brown, R. E., Burke, J. P., Epstein, M., & Harper, A. (2019, November). Quantity: It may not be as easy as it appears. Poster presentation at PME-NA⁴¹: 41st Annual Conference of the North American Chapter of the International Group for the Psychology of Mathematics Education. St. Louis, MO.
- Orrill, C., & Burke, J. (2018, December). *Seeing proportions: Using technology to reason about covarying relationships*. Workshop presented at ATMNE 2018 Fall Conference. Warwick, RI.
- Brown, R. E., Park, J., & Orrill, C. H. (2018, November). Knowledge resources for proportional reasoning in dynamic and static tasks. Brief research report presented at PME-NA⁴⁰: 40th Annual Conference of the North American Chapter of the International Group for the Psychology of Mathematics Education. Greenville, SC.
- Orrill, C. H., & Brown, R. E. (2018, November). Examining teacher knowledge resources for proportional reasoning visually. Brief research report presented at PME-NA⁴⁰: 40th Annual Conference of the North American Chapter of the International Group for the Psychology of Mathematics Education. Greenville, SC.
- Manizade, A., Kaarstein, H., Orrill, C., & Guo, K. (2018, July). *International perspectives: Measuring mathematics teachers' knowledge in the digital era*. Working Group held at the 42nd Annual Conference of the International Group for the Psychology of Mathematics Education, Umeå, Sweden.
- Orrill, C., Weiland, T., & Brown, R. (2018, July). *Teachers' abilities to identify proportional situations*. Oral Communication presented at the 42nd Annual Conference of the International Group for the Psychology of Mathematics Education, Umeå, Sweden.
- Orrill, C., & Brown, R. E. (2018, July). *Epistemic network analysis as a lens to understand teacher knowledge of proportions*. Poster presented at the 42nd Annual Conference of the International Group for the Psychology of Mathematics Education, Umeå, Sweden.
- Orrill, C. H., & Brown, R. E. (2018, June). *The Santa trap: When scaffolding is not enough to challenge teachers' pervasive beliefs*. Poster presented at the 13th International conference of the learning sciences (ICLS), London.

- Orrill, C. (2018, May). *Playing with proportions to understand mathematical structures*. Workshop presented at MassMATE Symposium, North Easton, MA.
- Orrill, C. H., Burke, J. P., Millett, J. E., & Park, J. F. (2018, April). Proportions playground: Using interactivity to support mathematical reasoning. Presented as part of A. Busey & C. McCulloch (Chairs), *Advancing online and blended professional development through NSF's DRK-12 program*. Structured poster session presented at the Annual Meeting of the American Educational Research Association, New York
- Orrill, C. H., Park, J. F., Millett, J. E., & Burke, J. P. (2018, April). *Teachers' abilities to reason about fixed numbers of variable-sized parts*. Poster presented at the Annual Meeting of the American Educational Research Association, New York.
- Orrill, C. H., Weiland, T., Brown, R. E., & Nagar, G. G. (2018, April). *Teachers' identification of the appropriateness of proportional reasoning*. Roundtable presented at the Annual Meeting of the American Educational Research Association, New York.
- Burke, J. P., Brown, R. E., Weiland, T., Orrill, C. H., & Nagar, G. G. (2017, October). *Teacher knowledge resources for proportional reasoning*. Brief Research Report presented at the 39th annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education, Indianapolis, IN.
- Orrill, C. H., Brown, R. E., Nagar, G. G., Millett, J., Park, J., & Burke, J. P. (2017, October). *Extending appropriateness: Further exploration of teachers' knowledge resources for proportional reasoning*. Research Report presented at the 39th annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education, Indianapolis, IN.
- Orrill, C. H., & Burke, J. P. (2017, October). *Using dynamic toys to explore continuous thinking in proportional situations*. Poster presented at the 39th annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education, Indianapolis, IN.
- Brown, R. E., Weiland, T., Nagar, G. G., Orrill, C. H., & Burke, J. P. (2017, February). *Useful knowledge resources for the teaching of proportional reasoning*. Paper presented at the 21st Annual AMTE Conference, Orlando, FL.
- Brown, R. E., Nagar, G. G., Orrill, C. H., Weiland, T., & Burke, J. (2016, November). *Coherency of a teacher's proportional reasoning knowledge in and out of the classroom*. Paper presented at the 38th annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education, Tucson, AZ.
- Nagar, G. G., Weiland, T., Brown, R. E., Orrill, C. H., & Burke, J. (2016). *Appropriateness of proportional reasoning: Teachers' knowledge used to identify proportional situations*. Paper presented at the 38th annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education, Tucson, AZ.
- Brown, R. E., Nagar, G. G., Orrill, C., Weiland, T., & Burke, J. (2016, July). *Considering teacher knowledge: A case study of proportional reasoning in and out of the classroom*. Paper presented at ICME-13, Hamburg.
- Burke, J., Orrill, C., Nagar, G. G., Weiland, T., & Brown, R. E. (2016, July). *Addressing coherence of teachers' knowledge relating fractions and ratios with Epistemic Network Analysis*. Paper to be presented at ICME-13, Hamburg.

- Brown, R. E., Nagar, G. G., Orrill, C. H., Weiland, T., & Burke, J. P. (2016, November). *Coherency of a teacher's proportional reasoning knowledge in and out of the classroom*. Research report to be presented at PME-NA 38, Tucson, AZ.
- Nagar, G. G., Weiland, T., Brown, R. E., Orrill, C. H., & Burke, J. (2016, November). *Appropriateness of proportional reasoning: Teachers' knowledge used to identify proportional situations*. Research report to be presented at PME-NA 38, Tucson, AZ.
- Quay, S., & Orrill, C. (2016, April). *Continuous improvement in teacher preparation: Two cases of DataWise for higher education*. Presentation at the MACTE/COMTEC/MAECTE Spring 2016 Conference, Sturbridge, MA.
- Weiland, T., Orrill, C. H., Brown, R. E., Nagar, G. G., & Burke, J. P. (2016, April). *Formulating a robust understanding of proportional reasoning for teaching*. Roundtable presented at the Annual Meeting of the American Educational Research Association, Washington, DC.
- Nagar, G. G., Brown, R. E., Orrill, C. H., Weiland, T., & Burke, J. P. (2016, April). *Considering teacher knowledge: A case study of proportional reasoning in and out of the classroom*. Paper presented at the Annual Meeting of the American Educational Research Association, Washington, DC.
- Nagar, G. G., Weiland, T., Orrill, C., & Burke, J. (2015, November). *Teachers' understanding of ratios and their connections to fractions*. Research Report presented at *PMENA 37*, Lansing, MI.
- Weiland, T., Nagar, G. G., Orrill, C., & Burke, J. (2015, November). Analyzing coherence of teachers' knowledge relating fractions and ratios. Brief Research Report presented at *PMENA 37*, Lansing, MI.
- Marum, T., Orrill, C. H., & Burke, J. P. (2015, April). *ENA as a tool for exploring teachers' understanding of similarity and proportion*. Poster presented at the Annual Meeting of the American Educational Research Association, Chicago.
- Nagar, G. G., Weiland, T., Burke, J. P. & Orrill, C. H. (2015, April). *Teachers' understanding of ratios and their connections to fractions*. Poster presented at the National Council of Teachers of Mathematics 2015 Research Conference, Boston.
- Nagar, G. G., Weiland, T., Orrill, C. H., & Burke, J. P. (2015, April). *Teachers' understanding of ratios and their connections to fractions*. Poster presented at the Annual Meeting of the American Educational Research Association, Chicago.
- Weiland, T., Nagar, G. G., Burke, J. P., & Orrill, C. H. (2015, April). *Analyzing coherence of teachers' knowledge relating fractions and ratios*. Poster presented at the Annual Meeting of the American Educational Research Association, Chicago.
- Weiland, T., Nagar, G. G., Orrill, C. H., & Burke, J. P. (2015, April). *Analyzing coherence of teachers' knowledge relating fractions and ratios*. Poster presented at the National Council of Teachers of Mathematics 2015 Research Conference, Boston
- Orrill, C. H., & Cohen, A. (2014, April). Purpose and conceptualization: The challenges of operationalizing best practices from psychometrics for measuring teacher knowledge. Presented in A. G. Izsák (chair), *Psychometric methods in math education: New opportunities and challenges*. Symposium presented at the Research Conference of the National Council of Teacher of Mathematics 2014, New Orleans.
- Zhang, D., Orrill, C. H., & Campbell, T. (2014, April). *Using the mixture Rasch model to explore knowledge resources students invoke in mathematics and science assessments*. Poster presented at the Annual Meeting of the American Educational Research Association, Philadelphia.

- Orrill, C. H., & Burke, J. P. (2013, November). *Fine-grained analysis of teacher knowledge: Proportion and geometry*. Research report presented at the 35th Annual Conference of the North American Chapter of the International Group for the Psychology of Mathematics Education (PME-NA 2013), Chicago.
- Orrill, C. H., & Burke, J. P. (2013, November). *Mapping knowledge coherence: A case in the clinic and in the classroom*. Poster presented at the 35th Annual Conference of the North American Chapter of the International Group for the Psychology of Mathematics Education (PME-NA 2013), Chicago.
- Orrill, C. H., Shaffer, D. W., & Burke, J. P. (2013, April). *Exploring coherence in teacher knowledge using epistemic network analysis*. Paper presented at the 2013 Annual Meeting of the American Educational Research Association, San Francisco.
- Orrill, C. H. (2013, April). Is this a proportion?: How teachers make sense of proportional situations. Presented in A. G. Izsák (chair), *How do middle grades teachers recognize proportional relationships?* Symposium presented at the Research Pre-session of the National Council of Teacher of Mathematics 2013, Denver.
- Orrill, C. H., & Burke, J. P. (2013, April). Fine-grained analysis of teachers' knowledge in visual multiplicative situations. Presented in A. G. Izsák (chair), *How do middle grades teachers recognize proportional relationships?* Symposium presented at the Research Pre-session of the National Council of Teacher of Mathematics 2013, Denver.
- Burke, J. P., & Orrill, C. H. (2012, November). *Personal knowledge and enacted knowledge: Exploring the transition from understanding to teaching proportions*. Brief Report presented at the 34th Annual Conference of the North American Chapter of the International Group for the Psychology of Mathematics Education (PME-NA 2012), Kalamazoo, MI.
- Burke, J. P., Orrill, C. H., & Shaffer, D. W. (2012, November). *Epistemic network analysis for exploring connectedness in teacher knowledge*. Poster presented at the 34th Annual Conference of the North American Chapter of the International Group for the Psychology of Mathematics Education (PME-NA 2012), Kalamazoo, MI.
- Orrill, C. H., & Burke, J. P. (2012, November). *Proportions, relations, and proportional relationships: One teacher's navigation between professional development and personal knowledge*. Brief Report presented at the 34th Annual Conference of the North American Chapter of the International Group for the Psychology of Mathematics Education (PME-NA 2012), Kalamazoo, MI.
- Orrill, C. H., & Shaffer, D. W. (2012, July). *Exploring connectedness: Applying ENA to teacher knowledge*. Paper presented at International Conference of the Learning Sciences 2102, Sydney, Australia.
- Orrill, C. H., & Brown, R. E. (2012, April). *Making sense of double number lines*. Poster presented at the Research Pre-session of the National Council of Teacher of Mathematics 2012, Philadelphia, PA.
- Orrill, C. H., & Kittleson, J. M. (2011, October). *Connecting PD to practice: Using tasks in 7th grade math*. Paper presented at the 33rd Annual Conference of the North American Chapter of the International Group for Psychology of Mathematics Education, Reno, NV.
- Orrill, C. H., & Burke, J. P. (2011, October). *CAREER: Coherence as a basis for understanding teachers' mathematical knowledge for teaching*. Poster presented at NSF REESE PI meeting, Pentagon City, VA.

- Brown, R. E., Chapman, M. A., & Orrill, C. H. (2011, April). *Turning the lens: Complementary perspectives from a professional development workshop*. Presented at NCTM 2011 Annual Meeting, Indianapolis, IN.
- Izsák, A., Wang, A., Cohen, A., & Orrill, C. H. (2011, April). *Effects of middle grades teachers' understandings of rational numbers on student achievement*. Paper to be presented at Annual Meeting of the American Educational Research Association, New Orleans.
- Lobato, J., Orrill, C. H., Druken, B., & Jacobson, E. (2011, April). Middle school teacher's knowledge of proportional reasoning for teaching. Paper presented as part of J. Lobato (chair), *Extending, expanding, and applying the construct of mathematical knowledge or teaching (MKT)*. Annual Meeting of the American Educational Research Association, New Orleans.
- Orrill, C.H. & Kittleson, J. (2011, April). Tracing professional development to practice: Understanding the role of mathematical knowledge for teaching in one teacher's instructional design. Paper presented as part of J. Lobato (chair), *Extending, expanding, and applying the construct of mathematical knowledge or teaching (MKT)*. Annual Meeting of the American Educational Research Association, New Orleans.
- Caglayan, G., Orrill, C. H., & Brown, R. E. (2010, October). *In-service middle grades teachers' use of double number lines to model word problems*. Paper presented at 32nd annual meeting of the North American chapter of the International Group for the Psychology of Mathematics Education, Columbus, OH.
- Izsák, A., Jacobson, E., de Araujo, Z., & Orrill, C. H. (2010, October). *Teachers' levels of units and fraction division*. Paper presented at 32nd annual meeting of the North American chapter of the International Group for the Psychology of Mathematics Education, Columbus, OH.
- Lee, S. J., & Orrill, C. H. (2010, October). *Exploring teachers' measurement division knowledge*. Paper presented at 32nd annual meeting of the North American chapter of the International Group for the Psychology of Mathematics Education, Columbus, OH.
- Berube, B., Hegedus, S. J., Orrill, C. & Tapper, J. (2010, July). *Does the teacher matter when implementing a new technology and curriculum program?* Paper presented at Psychology of Mathematics Education 34, Belo Horizonte, Brazil.
- Izsák, A., Lobato, J., Druken, B., Orrill, C., Jacobson, E., & Bradshaw, L. (2010, July). *Applying cognitive diagnosis models to measure middle grades teachers' multiplicative reasoning*. Paper presented at the 75th meeting of the Psychometric Society, Athens, GA.
- Orrill, C. H., Izsák, A., Jacobson, E., & de Araujo, Z. (2010, June). *Teachers' understanding of representations: The role of partitioning when modeling fraction arithmetic*. Poster presented at the 9th International Conference of the Learning Sciences, Chicago.
- Orrill, C. H. (2010, June). *GPS in action: Key design considerations*. Poster presented at the Second Representations of Mathematics Teaching Conference, Ann Arbor, MI.
- Izsák, A., Confrey, J. E., Orrill, C., Senk, S., & Kelly, A. (2010, April). *Using psychometrics to advance assessment in mathematics education*. Symposium presented at the Research Pre-session of the 88th Annual Meeting of the National Council of Teachers of Mathematics, San Diego.

- Izsák, A. G., Lobato, J., Stephens, B., Orrill, C. H., Jacobson, E. D., Bradshaw, L. P. (2010, April). Identifying attributes and developing items to assess middle grades' teachers multiplicative reasoning. In A. G. Izsák (chair). *Using cognitive attributes to develop mathematics assessments, opportunities, and challenges*. Symposium presented at the Annual Meeting of the American Educational Research Association, Denver, CO.
- Orrill, C. H., Jacobson, E., & de Araujo, Z. (2010, April). *Teachers' emerging understanding of fraction division as proportional reasoning in professional development*. Paper presented at the Annual Meeting of the American Educational Research Association, Denver.
- Orrill, C. (2010). Using mixture Rasch models, cognitive interviews, and case studies to understand professional development. In J. Cromley (chair), *Innovations in researching STEM teaching and learning: Measures, methods, and data analysis*. Session presented at 2010 REESE PI Meeting, Washington, DC.
- Orrill, C. (2010). Does it work: Building methods for understanding effects of professional development. Poster presented at 2010 REESE PI Meeting, Washington, DC.
- Kwon, N-Y. & Orrill, C. H. (2009, September). *Reflection-on-action of middle school mathematics teachers*. Paper presented at The 31st annual meeting of the North American chapter of the International Group for the Psychology of Mathematics Education, Atlanta, GA.
- Lee, S. J. & Orrill, C. H. (2009, September). *Middle grades teachers' reorganization of measurement fraction division concepts*. Paper presented at The 31st annual meeting of the North American chapter of the International Group for the Psychology of Mathematics Education, Atlanta, GA.
- Sexton, S., & Orrill, C. H. (2009, September). *The impact of professional development on two teachers' understanding and use of representations*. Paper presented at The 31st annual meeting of the North American chapter of the International Group for the Psychology of Mathematics Education, Atlanta, GA.
- Lee, S. J., Brown, R. E., Orrill, C. H., & Sexton, S. (2009, April). *Middle school teachers' problem solving strategies for interpreting rational number items using drawn representations*. Poster presented at the Research Pre-session of the 87th Annual Meeting of the National Council of Teachers of Mathematics Research Pre-session, Washington, D.C.
- Izsák, A., Orrill, C. H., Cohen, A. S., & Brown, R. E. (2009, April). *Assessing middle grades teachers' capacities to reason about arithmetic with rational numbers*. Paper presented at the annual meeting of the American Educational Research Association, San Diego, CA.
- Orrill, C.H., Brown, R. E., Sexton, S., & Lee, S. J. (2009, April). *Mathematics teachers' abilities to interpret fraction operations with drawn representations*. Paper presented at the Annual Meeting of the American Educational Research Association, San Diego, CA.
- Izsák, A., Lobato, J., Orrill, C. H., Cohen, A. S., & Templin, J. (2009). *Psychometric models and assessments of teacher knowledge*. Paper presented at the Conference on Research in Undergraduate Mathematics Education, Raleigh, NC.
- Orrill, C. (2008, November). *Does it work?: Building methods for understanding effects of professional development*. Paper presented at 2008 Association for Educational Communications and Technology Convention, Orlando, FL.
- Orrill, C. (2008, November). *Socratic seminar*. Invited presentation at 2008 Association for Educational Communications and Technology Convention, Orlando, FL.

- Strobel, J., Orrill, C., Richardson, J. & Moller, L. (2008, November). *Invited panel: Grant management*. Invited panel discussion to be presented at 2008 Association for Educational Communications and Technology Convention, Orlando, FL.
- Davis, J., Huddlestun, D., Koballa, T., Orrill, C., & Pierce, C. (2008, September). *Partnerships for professional developer development: Building a statewide community of support*. Panel discussion at 2008 PRISM Conference: Accepting the STEM Challenge, Atlanta.
- Kwon, N., & Orrill, C. (2008, July). *A comparison study of a teacher's reflection*. Poster presented at the Joint Meeting of PME 32 and the PME-NA XXX, Morelia, Michoacán – Mexico.
- Orrill, C. H., Sexton, S., Lee, S. J., & Gerde, C. (2008, June). *Mathematics teachers' abilities to use and make sense of drawn representations*. Paper presented at the International Conference of the Learning Science, Utrecht, Netherlands.
- Orrill, C. H., Geisler, S., Brown, R., & Brunaud-Vega, V. (2008, June). *Questioning teacher goals in professional development: Do goals really make a difference?* Poster presented at the International Conference of the Learning Sciences, Utrecht, Netherlands.
- Sexton, S., Orrill, C., & Gerde, C. (2008, March). *Middle grades teachers' flexibility with drawn representations*. Paper presented at the Annual Meeting of the American Educational Research Association, New York.
- Geisler, S. & Orrill, C. (2007, October). *Creating classroom video of teacher best practices to affect change in teacher pedagogy*. Session presented at Georgia Mathematics Conference, Eatonton, GA.
- Murray, E., Rhodes, G., & Orrill, C. (2007, October). *Mining the mathematics*. Session presented at Georgia Mathematics Conference, Eatonton, GA.
- Orrill, C., Huddlestun, D. & Bleich, L. (2007, October). *Selecting textbooks for the high school GPS*. Session presented at the Georgia Mathematics Conference, Eatonton, GA.
- Orrill, C., Rhodes, G., & Murray, E. (2007, October). *Professional development for professional developers*. Session presented at Georgia Association of Mathematics Teacher Educators Conference, Eatonton, GA
- Orrill, C., Rhodes, G., & Murray, E. (2007, October). *Creating high cognitive demand GPS tasks for middle school*. Working session presented at Georgia Mathematics Conference, Eatonton, GA.
- Rhodes, G., Murray, E., & Orrill, C. (2007, October). *Creating high cognitive demand GPS tasks for high school*. Working session presented at Georgia Mathematics Conference, Eatonton, GA.
- Rhodes, G., Murray, E., & Orrill, C. (2007, October). *Supporting teachers through hands-on learning*. Session presented at Georgia Association of Mathematics Teacher Educators Conference, Eatonton, GA.
- Recesso, A. & Orrill, C. (2007, April). *Technology and today's educator*. Invited presentation at *Teaching in the 21st Century* seminar hosted by Houghton Mifflin Company (TeamUp Faculty Programs), Chicago.
- Orrill, C. H. & Kwon, N-Y (2007, April). *Understanding teacher reflection: Analysis of reflection over time*. Poster presented at the National Council of Teachers of Mathematics Research Pre-session, Atlanta, GA.
- Bleich, L., Huddlestun, D., Ledford, S., & Orrill, C. (2006, October). *Selecting textbooks for the GPS*. Session presented twice at the Georgia Mathematics Conference, Eatonton, GA.

- Geisler, S., & Orrill, C. (2006). *Creating classroom video of teacher best practices to affect change in teacher pedagogy*. Presented at the 2006 Conference of the Association for Educational Communications and Technology, Dallas, TX.
- Orrill, C., & Polly, D. (2006). *Using data to design and refine a technology-integrated professional development model*. Paper presented at the 2006 Convention of the Association for Educational Communications and Technology, Dallas, TX.
- Recesso, A., & Orrill, C. (2006). *Emerging Methods: Video as a research tool*. Panel presented at the 2006 Convention of the Association for Educational Communications and Technology, Dallas, TX.
- Ledford, S., Bleich, L., & Orrill, C. (2006, October). *GPS call for using GSP*. Session presented at the Georgia Mathematics Conference, Eatonton, GA.
- Orrill, C.H., Anthony, H. G., Izsák, A., & Singleton, E. (2006, June). *Tupelo enacted: How teachers shape learning opportunities in middle grades mathematics*. Poster presented at the International Conference of the Learning Sciences, Bloomington, IN.
- Duffy, T., Kirkley, J. R., & Orrill, C. (2006, June). *Design strategies for online professional development: Design process and issues of collaboration, community, and access*. Paper discussion at 2006 AECT Summer Research Symposia, Bloomington, IN.
- Bleich, L. B., Ledford, S. D., Orrill, C. H., & Polly, A. B. (2006). *Crazy data: The analysis of justification, flow, and explanation in the problem-solving process*. Paper discussion (roundtable) presented at the American Education Research Association Annual Meeting, San Francisco.
- Orrill, C. H., Hannafin, M. J., & Recesso, A. (2005, October). *Teacher development through technology: One lab's initiatives*. Paper presented at the International meeting of the Association for Educational Communications and Technology, Orlando.
- Orrill, C. H., Izsák, A., Singleton, E., & Anthony, H. G. (2005, October). *Mathematical connections in open-ended problem-solving environments*. Poster presented at Psychology of Mathematics Education – North America, Roanoke, VA.
- Orrill, C. H., Rich, P., Shepherd, C., & Singleton, E. (2005, October). *The data-driven evolution of a technology-integrated professional development model*. Paper presented at the International meeting of the Association for Educational Communications and Technology, Orlando.
- Polly, D., Bleich, L., Ledford, S., & Orrill, C. H. (2005, October). *InterMath GPS: Addressing teachers' needs with the design of a learner-centered professional development course*. Paper presented at the International meeting of the Association for Educational Communications and Technology, Orlando.
- Recesso, A., Hannafin, M., & Orrill, C. (2005, October). *Transforming teacher preparation and development through technology: One lab's initiatives*. Invited presentation 2005 Annual Conference of the Southeastern Association for Science Teacher Education, Athens, GA.
- Izsák, A. G., Orrill, C. H., & Tunç-Pekkan, Z. (2005, April). *Teaching and learning fraction multiplication using drawn representations*. Poster presented at 83rd Annual Meeting of the National Council of Teachers of Mathematics, Anaheim.
- Orrill, C. H., Anthony, H. G., & Singleton, E. (2005, April). *Connection and conflict in one teacher's implementation of reform-oriented materials*. Roundtable presented at the Annual Meeting of the American Educational Research Association, Montreal.

- Polly, A., Ledford, S., & Orrill, C. (2005, April). *Learning technology in the context of professional development*. Roundtable presented at the Annual Meeting of the American Educational Research Association, Montreal.
- Bleich, L., Orrill, C., & Ledford, S. (2004, October). *InterMath: Professional development for middle grades teachers*. Presentation at Georgia Mathematics Conference, Eatonton, GA.
- Polly, A., Orrill, C., Ledford, S., & Bleich, L. (2004, October). *Patterns and algebraic thinking through spreadsheets*. Presentation at Georgia Mathematics Conference, Eatonton, GA.
- Singleton, E., Orrill, C., Rich, P., & Shepherd, C. (2004, October). *Math and technology for young learners*. Presentation at Georgia Mathematics Conference, Eatonton, GA.
- Orrill, C., Ledford, S., Polly, D., & Erbas, A. K. (2004, April). *InterMath: Five Implementations*. Poster presented at the Research Presession of the 82nd Annual Meeting of the National Council of Teachers of Mathematics, Philadelphia.
- Izsák, A. G., Orrill, C. H., & Findell, B. R. (2004, April). Coordinating problem-solving strategies and multiplication knowledge in one sixth-grade classroom. Paper presented at the Annual Meeting of the American Educational Research Association, San Diego.
- Schuh, K., & Orrill, C. H. (2004, April). Negotiating meaning: An analysis of interactions. Roundtable to be presented at the Annual Meeting of the American Educational Research Association, San Diego.
- Orrill, C. H., Barbour, M., Bleich, L., Calhoun, J., & Sikes, C. (2004, March). *Teacher learning in an online self-directed environment*. Paper presented at Society for Information Technology & Teacher Education 2004, Atlanta.
- Orrill, C., Polly, D., Ledford, S., & Erbas, K. (2004, March). *Technology-enhanced mathematical investigations – The InterMath project*. Poster presented at Society for Information Technology & Teacher Education 2004, Atlanta.
- Polly, D., Erbas, K., Ledford, S., Orrill, C. (2004, March). *Teacher growth through technology-enhanced mathematical investigations: The InterMath experience*. Brief paper presented at Society for Information Technology & Teacher Education 2004, Atlanta.
- Singleton, E., Bleich, L., Orrill, C., Rich, P., & Shepherd, C. (2004, March). *Technology integration in mathematics*. Poster presented at Society for Information Technology & Teacher Education 2004, Atlanta.
- Barbour, M., Orrill, C., & Bleich, L. (2004, February). *Online professional development for technology integration*. Concurrent session to be presented at 2004 Georgia Educational Technology Conference, Macon, GA.
- Orrill, C., Erbas, K., Polly, D., & Ledford, S. (2004, February). *Using technology in mathematics: InterMath professional development*. Concurrent session to be presented at 2004 Georgia Educational Technology Conference, Macon, GA.
- Polly, D., Orrill, C. H., Erbas, A. K., & Ledford, S. (2004, February). *Learner-Centered Professional Development in Mathematics*. Paper presented at the Eastern Educational Research Association's Annual Meeting, Clearwater, FL.
- Hickey, D., & Orrill, C. (2003, April). *Design-based research: A new paradigm for instructional technology research*. Invited presentation at the Annual Meeting of the American Educational Research Association, Chicago.

- Orrill, C. H., & Anthony, H. G. (2003, April). Implementing reform curriculum: A case of who's in charge. Presented at the Annual Meeting of the American Educational Research Association, Chicago.
- Orrill, C. H., & Ledford, S. (2003, April). *InterMath*. Presented as part of a session titled Realizing Opportunities in Mathematics: Improving Student Achievement. Presented at Georgia Educational Technology Consortium Conference 2003, Macon, GA.
- Erbas, A. K., Umberger, S., Glazer, E. M., & Orrill, C. H. (2002, October). *InterMath: Technology-enhanced, learner-centered professional development*. Short paper presented at Psychology of Mathematics Education – North America, Athens, GA.
- Orrill, C. H., Erbas, A. K., & Glazer, E. M. (2002, October). *Responsive design: Creating a scaffolding system to support teacher professional development*. Paper presented at Psychology of Mathematics Education – North America, Athens, GA.
- Brown, S., Erbas, A. K., Glazer, E., Orrill, C. H., & Umberger, S. (2001, November). *Learner-centered professional development environments in mathematics: The InterMath experience*. Roundtable presented at the International meeting of the Association for Educational Communications and Technology, Atlanta.
- Orrill, C. H., Black, C., & Hackenberg, A. (2001, November). *Implementing change: A case study in one mathematics classroom*. Paper presented at the International meeting of the Association for Educational Communications and Technology, Atlanta.
- Orrill, C. H., & Galloway, C. (2001, November). *Developing a scaffolding system to support mathematical investigations*. Paper presented at the International meeting of the Association for Educational Communications and Technology, Atlanta.
- Orrill, C. H. (2001, April). Supporting online PBL: Design considerations for collaborative problem-solving communication tools. In T. Koschmann (chair), *Studying collaboration in distributed PBL environments*. Structured Poster Symposium to be presented at American Educational Research Association Annual Meeting, Seattle, WA.
- Orrill, C. H. (2000, April). Designing a problem for online delivery. In S. Sage (chair) *Problem-based learning in an online instructional technology course*. Structured Poster presented at American Educational Research Association Annual Meeting, New Orleans, LA.
- Orrill, C. H. (2000, February). *Building learner-centered classrooms: A professional development framework for supporting critical thinking*. Presented at the Association for Educational Communications and Technology National Convention, Long Beach, CA.
- Hawley (Orrill), C. L., & Duffy, T. M. (1998, April). *The role of the teacher in simulation learning environments*. Poster presented at American Educational Research Association Annual Meeting, San Diego, CA.
- Hawley (Orrill), C. L., Kirkley, J. R., Moore, J. A., & Duffy, T. M. (1998, April). *The impact of technology on building learner-centered environments in higher education: Four case studies*. Roundtable presented at American Educational Research Association Annual Meeting, San Diego, CA.
- Dueber, B., Hawley (Orrill), C., & Duffy, T. (1998, February). *Supporting critical thinking with web-based conferencing*. Paper presented at the Association for Educational Communication and Technology National Convention, St. Louis, MO.
- Hawley (Orrill), C. L., & Duffy, T. M. (1998, February). *Design model for learner-centered, computer-based simulations*. Presented at the Association for Educational Communications and Technology Annual Meeting, St. Louis, MO.

- Kirkley, J., Moore, J., Hawley (Orrill), C., & Duffy, T. (1998, February). *Using technology to create innovative learning environments in higher education: Four studies*. Presented at the Association for Educational Communications and Technology National Convention, St. Louis, MO.
- Duffy, T. M., & Hawley (Orrill), C. L. (1997, March). *A design analysis of the Chelsea Bank program*. Paper presented at American Educational Research Association Annual Meeting, Chicago, IL.
- Hawley (Orrill), C. L. & Duffy, T. M. (1997, April). *Student teacher interactions in the Chelsea Bank simulation*. Paper presented at American Educational Research Association Annual Meeting, Chicago, IL.
- Boling, E., Hawley (Orrill), C., Michael, N., & Schwartz, N. (1997, February). *How to produce professional level work in an academic course*. Presented at the Association for Educational Communications and Technology National Convention, Albuquerque, NM.
- Hawley (Orrill), C. L., & Kirkley, J. R. (1997, February). *Computer and Internet use in K-12 classrooms: Myths and realities*. Roundtable presented at the Association for Educational Communications and Technology National Convention, Albuquerque, NM.
- Slemp, C., Bray, M., & Hawley (Orrill), C. (1997, February). *Creating a showcase for instructional and technological innovations: The DID WWW site*. Presented at the Association for Educational Communications and Technology National Convention, Albuquerque, NM.
- Hawley (Orrill), C., Moore, J., & Chuang, W. (1996, February). *Attitudes of high-end email users*. Paper presented at the Association for Educational Communications and Technology National Convention, Indianapolis, IN.
- Moore, J., Kirkley, J., Hawley (Orrill), C., & Duffy, T. (1996, November). *Teaching with technology in higher education: A cross-case analysis*. Paper presented at Hypermedia '96, Indianapolis, IN.

OTHER PROFESSIONAL ACTIVITIES

Workshops Outside of Grant-Funded Teacher Professional Development Efforts

- Orrill, C., Gearty, Z., & Wang, K. (2021, August). Computational thinking counts in elementary grades. Workshop presented twice as part of Southeastern MA STEM Network *Diversity, equity, inclusion (DEI) program 2021: Addressing DEI while advancing STEM education in education, in the workplace, in communities*. Virtual.
- Witzig, S.B., Orrill, C. H., & Stroup, W. (2018, Spring). Writing research and teaching Statements for Job Applications. *STEM Education doctoral student organization – TANGENT*, University of Massachusetts Dartmouth.
- Witzig, S. B., Orrill, C. H., Kayumova, S. (2016, April). Curriculum vitae workshop. *STEM Education doctoral student organization – TANGENT*, University of Massachusetts Dartmouth.
- Collier, W., Shaffer, D., & Orrill, C. (2014). *Tutorial on epistemic network analysis*. One-day workshop presented at the 4th International Conference on Learning Analytics and Knowledge, Indianapolis, IN.
- Shaffer, D. W., Arastoopour, G., & Orrill, C. (2013, June). *Measuring collaborative thinking using epistemic network analysis*. One-day workshop presented at the 10th International Conference on Computer Supported Collaborative Learning, Madison, WI.
- Orrill, C., & Hannafin, M. (2008). *Building a technology research agenda: An early career symposium*. 1.5 day workshop for the Association for Educational Communications & Technology. (Funded by the National Science Foundation.)

- Hannafin, M., & Orrill, C. (2007). *Writing effective federal grant proposals: Lessons learned from successful researchers*. Half-day symposium for the Association for Educational Communications & Technology. (Funded by the National Science Foundation.)
- Orrill, C., & Joseph, D. (2006). *Problems in planning: Attaching the issues of planning design-based research*. Presented at International Conference of the Learning Sciences: Bloomington, IN.
- Orrill, C., & Black, C. (2001). *Strategies for math instruction (5th grade – high school)*. Presented at Teaching Mathematics for Student Success: Watkinsville, GA. (Sponsored by Northeast Georgia RESA)
- Duffy, T. M., & Hawley, C. L. (May, 1997) *Distance education tools and a pedagogical framework*. Presented at the Connecticut Higher Education Technology Association's Digital Video Expo XVII, Hartford, CT.
- Duffy, T. M., & Hawley, C. L. (Feb, 1997) *Distance education tools and a pedagogical framework*. Presented at the Association for Educational Communications and Technology National Convention, Albuquerque, NM.
- Duffy, T. M., & Hawley, C. L. (July, 1996). *Problem based learning and the Internet*. Presented at DePaul University, Chicago, IL.
- Hawley, C. L., & Orrill, J. (1996) *Searching the Internet*. Presented to the Martinsville Teachers on the Internet, Martinsville, IN.

Technical Reports

- Izsák, A., Lobato, J., Orrill, C. H., Jacobson, E., (2010). *Diagnosing teachers' multiplicative reasoning attributes*. Unpublished report, Department of Mathematics and Science Education, University of Georgia, Athens, GA.
- Orrill, C. H., Izsák, A., & Cohen, A. (2010). *Does it work: Building Methods for Understanding Effects of Professional Development. Year 4 annual report* (Submitted to the National Science Foundation)
- Orrill, C. H., Izsák, A., Cohen, A., Templin, J., & Lobato, J. (2010). *Preliminary observations of teachers' multiplicative reasoning: Insights from Does it Work and Diagnosing Teachers' Multiplicative Reasoning projects*. Technical Report #6. Dartmouth, MA: Kaput Center for Research and Innovation in STEM Education, University of Massachusetts Dartmouth.
- Orrill, C. H., Izsák, A., & Cohen, A. (2009). *Does it work: Building Methods for Understanding Effects of Professional Development. Year 3 annual report* (Submitted to the National Science Foundation)
- Orrill, C. H., Izsák, A., & Cohen, A. (2008). *Does it work: Building Methods for Understanding Effects of Professional Development. Year 2 annual report* (Submitted to the National Science Foundation)
- Orrill, C. H., Izsák, A., & Cohen, A. (2007). *Does it work: Building Methods for Understanding Effects of Professional Development. Year 1 annual report* (Submitted to the National Science Foundation)
- Orrill, C. H. (2007). *Jefferson City Schools math science partnership 2006-2007: Effectiveness of professional development: Evaluating the Jefferson City Schools math science partnership*. Athens, GA: Learning & Performance Support Laboratory.

- Orrill, C. H. (2007). *Richmond County math and science partnership 2006-2007: Effectiveness of professional development: Evaluating the Richmond County math and science partnership*. Athens, GA: Learning & Performance Support Laboratory.
- Orrill, C. H. (2007). *Washington-Wilkes math science partnership 2006-2007: Effectiveness of professional development: Evaluating the Washington-Wilkes/UGA math science partnership*. Athens, GA: Learning & Performance Support Laboratory.
- Izsák, A., Findell, B., Olive, J., & Orrill, C. (2004). *Coordinating students' and teachers' algebraic reasoning: Year 2 annual report*. (Submitted to the National Science Foundation).
- Izsák, A., Findell, B., Olive, J., & Orrill, C. (2003). *Coordinating students' and teachers' algebraic reasoning: Year 1 annual report*. (Submitted to the National Science Foundation).
- Orrill, C. H., Calhoun, J. K., & Sikes, C. K. (2002). *Learning in LTTS: Value, usability, and professional growth*. Athens, GA: Learning & Performance Support Laboratory.
- Center for Innovation in Assessment (2001). *A study examining three issues concerning an innovative classroom program: Distance education, accountability, and problem solving, 1998-2001. Final Report – August 31, 2001*. Bloomington, IN: Author.
- Center for Innovation in Assessment (1998). *Assessing learning and supporting the “teacher as coach” in Chelsea Bank simulations*. Bloomington, IN: Author.
- Center for Reading and Language Studies (1996). *Cognitive, social, and literacy competencies: The Chelsea Bank simulation report*. (Year One Final Report). Bloomington, IN: Author.
- Fischler, A., Hawley, C., & Kirkley, J. (1995) *Building educational tools for educational concerns: A needs analysis of the concerns facing Internet use in the K-12 educational systems*. Bloomington, IN: Center for Excellence in Education – Research and Development.
- Hawley, C., Kirkley, J., Moore, J., & Duffy, T. (1996) *Teaching with technology at Indiana University - A cross-case analysis*. Bloomington, IN: Office of Information Technology, Indiana University.
- Orrill, C. H. (2000) *Summary: Building technology-based, learner-centered environments: Professional development in real time*. Athens, OH: Ohio University. (Prepared for the New York City School Board Division of Assessment and Accountability)

Software Development & Instructional Development Projects

- Proportions Playground (2016-2019). Development of interactive “toys” to support teachers’ reasoning about proportional situations. Served as project director.
<http://kaputcenter.org/proportions-playground/>
- Fraction Bars (2014). Redesign of program for web-based delivery. Served as project director.
<http://kaputcenter.org/fraction-bars/>
- GPS in Action (2005-2008). Online videos designed to support mathematics and science teachers in implementing the new state standards. Served as coordinator for science videos and director for mathematics videos. (Online at: <http://lpsl.coe.uga.edu/mile3/resa/gpsinaction/introduction.html>)
- Obtaining Hardware and Software: How do I write a fundable grant for obtaining technology in my school (2002). Online graduate course developed for the Learning to Teach with Technology Studio. Served as primary author of course.
- eWorkshop design for Ohio University Without Boundaries (2001-2003): Development of online strategy for design of self-paced, reorganizable workshops for personal growth.

Learning Objects in Support of the MBAWB (2000-2001): Online information database to support problem-based learning MBA program. Acted as instructional designer and initial information architect and navigation designer.

Pilot MPA Program: Ohio University Without Boundaries (2000): Create a framework for converting face-to-face MPA program to online program. Acted as instructional designer and developed initial prototype.

Problem Solving in Classroom Inc. Simulations (1997-1998): Video for integrating problem-solving skills into teaching. Acted as project manager and co-instructional designer.

Wisdom Tools: Benchmarks Project (1997): “All-in-One” course development tools for the Web co-evaluator.

DocuHelp (1996): Computer-based interactive manual. Acted as interface designer and co-instructional designer.

Martinsville Teachers on the Internet (1996): Training and support effort for teachers using the Internet. Acted as consultant, trainer, and instructional designer.

Peaceful Classrooms (1996-1997): Video developed to improve classroom management. Acted as project manager, co-wrote instructional manual.

AECT-DID Website Design Project (1995): Website designed for members of the Division of Instructional Development in the Association for Educational Communications and Technology. Acted as project manager working with a large team. Continued as site manager until 1999.

Multimedia Exploration of Motown Instruments (1995): Interactive CD-ROM developed for faculty member to support his students in learning the sounds of musical instruments common to Motown music. Acted as interface designer.

TEACHING EXPERIENCE

Courses Taught at UMass Dartmouth

MTE 502: Math Methods for Middle School Teachers (Fall 2019)
 MTE 503: Math Methods for High School Teachers (Fall 2019)
 MTE 531: Looking for Patterns & Making Sense of Structures in Mathematics (Fall 2022)
 EDU 532: Practicum (practicum supervision) (Spring 2018)
 MTE 522: Number Sense for Elementary Teachers (Fall 2011, 2012)
 MTE 530: Proportional Reasoning for Middle School Teachers (Fall 2013, Spring 2016)
 MTE 652: Introduction to Mathematics Education Research (Fall 2018)
 MTE 654 & MTE 681: Research Seminar (Spring 2015, 2017)
 MTE 655: Developing Research Skills, Part 1 (Spring 2010)
 MTE 661: Research on Teacher Education, Part 1 (Fall 2010, 2011, 2016)
 MTE 663: Developing and Implementing STEM Curricula (Spring 2011)
 MTE 667: Research in Elementary Mathematics Education (Spring 2013)
 MTE 680: Authentic Learning (Internship) (Fall 2014)
 MTE 682: Developing Research Skills, Part 2 (Spring 2011, 2012, 2013, 2014)
 MTE 751: Contemporary Issues in K-8 Classrooms (Fall 2012)
 MTE 757: K-12 STEM Reform in a Political Context (Spring 2012; Fall 2014)
 STM 601: Introduction to Mathematics Education Research (Fall 2019, 2020)
 STM 623: Mathematics Education Research Seminar 1 (Spring 2021)
 STM 624: Mathematics Education Research Seminar 2 (Spring 2021)
 STM 625: Introduction to Science Education Research (Fall 2019, 2020)

STM 679: Research Skills 2 (Spring 2021, 2022)

STM 690/790: Special Topics: STEM Education Reform in a Political Context (Spring, 2023)

Courses Taught Elsewhere

EMAT 6410: Mathematical Learning in PreK-5 (Fall, 2009) - UGA

EMAT 8990: Doctoral Topical Seminar (Fall, 2007) - UGA

Topic: Understanding *Mathematics in Context*, 1 Credit Hour

EMAT 8990/ESCI 8990/EDIT 9990: Doctoral Topical Seminar (Summer, 2007) - UGA

Topic: Research on Professional Development, 3 credit hours

EDIT 9990: Doctoral Topical Seminar (Spring, 2006) - UGA

Topic: Design-Based Research (co-instructor with Tom Reeves)

Masters Research Project (Spring, 2000) - Ohio University

Educational Applications of the Internet (Spring, 2000) - Ohio University

Instructional Design (Winter, 2000; Spring, 2000) - Ohio University

(Bookend-style online course)

Internship: Theory into Practice (Winter, 2000) - Ohio University

Technology Applications in Education (Fall, 1999) - Ohio University

Teaching with the Internet Across the Curriculum (1998-99) - Indiana University

(Taught 3 times – Online course)

Developing WWW Sites for Public Schools (Summer, 1998) - Indiana University

Dissertation and Thesis Support

Dissertations at UMass Dartmouth

- Chair – 7 completed dissertations in Mathematics Education (James Burke, 2017; Rebecca Norton, 2019; Martha Epstein, 2022; Zarina Gearty, 2023; Robert Nanna, 2023; Jinsook Park, 2023) with one in progress (Kun Wang, anticipated completion 2023)
- Co-Chair – 1 completed dissertation in Mathematics Education (Gal Gili Nagar, 2019), co-chair with Dr. Stephen Hegedus
- Doctoral Committee Member
 - UMass Dartmouth Mathematics Education: Corey Brady (2013), Yenny Otalora (2017), Travis Weiland (2017), Hamza Malik (anticipated 2023), Ali Daniyal Asif (anticipated 2025)

Dissertations at University of Georgia

- Chair – 1 completed dissertation in Instructional Technology (Sandra Geisler, 2009)
- Co-chair (with Paola Sztajn) – 1 completed dissertation in Mathematics Education (Sarah Ledford, 2006)
- Co-chair (with Janette Hill) – 1 Ed.S. in Learning, Design, and Technology (Dean Elliott, 2012)
- Doctoral Committee Member – 11 completed dissertation committees – UGA
 - 5 Mathematics Education (Shelly Allen, Daniel Brink, Rachael Brown, Zandra de Araujo, & Soo Jin Lee)
 - 6 Instructional Technology (Nicole Collier, Chad Galloway, Catia Harriman, Andrew Polly, Peter Rich, & Feng Wang)

Masters Thesis Advising and Committees

- Masters Committee Member – 1 completed Masters Thesis – Mathematics Education (Jessica Cziska) – UMass Dartmouth

- Masters Committee Member – 1 completed Masters Thesis – Science Education (Evans Mahaya) - UGA
- Doctoral Committee Member – 2 completed dissertation committees – Ohio University
- Masters – Chair – 24 completed Masters Research Projects – Ohio University

Effort Related to Grant-Funded Activities

- Mentored 20 Ph.D. students on research project at UMass Dartmouth (2011 – present). Have co-presented and/or co-authored with 13 of them.
- Managed 49 Ph.D. or Masters students on projects at UGA (2000 – 2009). Have co-presented and/or co-authored with 27 of them.
- Postdoctoral Associates (have co-presented or co-authored with all)
 - Zhichun “Lukas” Zhu (2020 – 2021)
 - James Burke (2017 – 2019)
 - Ginger Rhodes (2007 – 2008)
 - Gunhan Caglayan (2008 – 2009)

SERVICE TO THE FIELD

Grant Reviews

Department of Education – Institute of Education Sciences (2010 – 2013, 2017)

National Science Foundation: Reviewer in EHR and CISE (2005 - present)

National Priorities Research Program for the State of Qatar (2007 - present)

Georgia’s *Improving Teacher Quality* grants program

SBIR Program through Office of Educational Research and Improvement – Department of Education (2002)

Research Center for Educational Technology grant program (2000 - 2003)

Conference Reviews

Reviewer for AMTE (2017-present)

Reviewer for PME-NA (2009-present)

International Conference of the Learning Sciences (ICLS) Annual Meeting (2004-present)

- Senior Reviewer for ICLS 2022, ICLS 2023

Reviewer for the National Council of Teachers of Mathematics (NCTM) Research Pre-session/Research Conference (2007, 2010-present)

IADIS CELDA conference, Barcelona, Spain (2006)

AECT Annual Meeting (1998-2007)

IPSI International Symposium on Challenges in the Internet and Interdisciplinary Research (2004) (reviewer by invitation)

Computer Supported Collaborative Learning Conference hosted by the International Society of the Learning Sciences (2004)

AERA Annual Meeting:

- Division C, Section 3: Mathematics Education (2004-2005, 2009, 2012)
- Division C, Section 5: Learning Environments (2001-2003, 2010)
- Division C, Section 7: Technology Research (2002-2004)

- SIG: Advanced Technologies for Learning (2004-2008)
- SIG: Instructional Technology (2004-2006)
- SIG: Research in Mathematics Education (2005-2008, 2011, 2015-present)
- SIG: Learning Sciences (2015-present)

Journal & Book Reviews

Editorial Board for *Journal for Research in Mathematics Education* (2022 – present)

Editorial Board for *Investigations in Mathematics Learning* (2021 – present)

Editorial Board for *Journal of Mathematics Teacher Education* (2021 – present)

Co-Editor for Special Issue *Research in Mathematics Education* (2019-2020)

Editorial Board for *Journal of the Learning Sciences* (2011 – present)

Editorial Board for *Elementary School Journal* (2012-2022)

Editorial Board for *Interdisciplinary Journal of Problem-based Learning* (2010-2013)

Editorial Advisory Board Member for *TPACK in the Digital Age* (2019 - Niess, Gillow-Wiles, & Angeli, Eds.)

Consulting Editor for the Research Section of *Educational Technology Research & Development* (2011-2013)

Reviewer for:

- *Educational Researcher*
- *Educational Research for Policy and Practice*
- *Teaching and Teacher Education*
- *Mathematical Thinking and Learning*
- *Journal for Research in Mathematics Education*
- *Cognition and Instruction*
- *Educational Technology Research & Development*
- *Interdisciplinary Journal of Problem-based Learning*
- *The Mathematics Educator*
- *School Science and Mathematics*
- *Journal of Mathematical Behavior*
- *Journal of Teacher Education*
- *European Journal of Education*
- *Journal of Experimental Education*

Editorial Advisory Board for *Cases on Developing Teachers' Technological Pedagogical Content Knowledge* (2017-2018)

Editorial Advisory Board member for *Cases on Developing Teachers' Technology Pedagogical Content Knowledge (TPACK)*

Reviewer (by invitation) for *Journal of Educational Computing Research* special issue on Cognitive Tools for Collaborative Communities (2006)

Reviewer for *Handbook of Research on Educational Communications and Technology* (2011-2012, 2 chapters)

Reviewed book proposal for Lawrence Erlbaum Associates (2004)

Reviewer for *TechTrends* (2005)

Other Service to the Field

Program Co-Chair for Division C, Section c: Mathematics of the American Educational Research Association for 2023 & 2024 Annual Meeting.

Steering Committee Member for PME-NA (October 2017- November 2021)

- Chair – Scholarship Subcommittee (2017-2019)
- Chair-elect – Steering Committee (2019)
- Chair – Steering Committee (2020)
- Past Chair (non-voting) – Steering Committee (2021)

Association of Mathematics Teacher Educators Research Committee (AMTE) (Feb 2019 - Feb 2022)

Committee for selection of Early CAREER Award and Best Paper Award for SIG-IT in AERA (2017)

Mentor at mentoring lunch – 2016 -2018 Annual meetings of PME-NA

Mentor – 2012 National Council of Mathematics Research Pre-session “Graduate Student, Junior Faculty, and Researcher Mentoring Session”

Discussant - 2010 Annual Meeting of the American Educational Research Association – Session Title: Student learning in mathematics & design of learning tasks

UNIVERSITY SERVICE at UMass Dartmouth

a. Service to the Department

Interim Graduate Program Director, STEM Ed PhD Program (Fall 2021)
Chair, STEM Education & Teacher Development (2013-2017)
Graduate Program Director, MAT Programs (2013 – 2017)
MAT Committee (2013 – present)
MAT Mathematics Advisor (2010-2017)
MAT Assessment Committee (2013 – 2017)
PhD Committee (2013 – present)
Search Committee Chair, Senior faculty in STEM Ed (2015) – 1 hire
Search Committee Chair, FTL Search (2016) – 1 hire
Search Committee Chair, Special Education Search (2013-2104) – closed
Search Committee, ELL Search (2014) – 2 hires
Search Committee Chair, FTL Search (2014) – 1 hire
Departmental Webmaster (2010-2014)
Mathematics Education Ph.D. Graduate Program Director (2011-2013)
STEM Education TaskStream Coordinator (2012-2013)
STEM Education Senior Faculty Search Committee (2011) - closed
STEM Education Faculty Search Committee (2011) – 2 hires
STEM Graduate Committee (2010-2013)
Mathematics Education Faculty Search Committee (2009-2010) – 1 hire
Ph.D. Subcommittee (2009-2010)
Math & Science Initial/Professional License subcommittee (2010)

b. Service to the College

Serve on Search Committee for Postdoctoral Fellow in Chemistry (2021)
STEM Representative to Content Area Task Force as part of DESE re-review (Spring, 2012)

STEM Representative to Elementary Area Task Force as part of DESE re-review (Spring, 2012)
Kaput Center Executive Board Member (2011 – present)
Serve as Dean’s Representative on the Creative Economy Grant (2010 – 2013)
Conducted alignments of Middle and High School Methods courses as part of DESE review of Initial Licensure program (2010-2011)
Serve as SEPPCE representative to the College Curriculum Committee (Fall, 2010)
Research Scientist in the Kaput Center for Research & Innovation in STEM Education (2010-present)

c. Service to the University

Faculty Senate, at-large member (2019-2022)
Faculty Senate Steering Committee (2019-2021)
Center for Portuguese Studies and Culture Evaluation Committee Member (2021)
Director of the Kaput Center (2017-2020, 2021-2023) & Co-Director of Kaput Center (2014-2017)
CONNECT Regional STEM Planning Committee (2019)
Student-Faculty Academic Affairs Committee appointed Education faculty member (February 2018-present)
ELAC (Education Licensure Accreditation Committee) (2016-2017)
TEC (Teacher Education Council) (2013-2017)
Chair, Licensure Coordinating Committee (2013-2017)
Chair, K-12 Task Force as part of UMass Dartmouth 2020 Strategic Planning (2013)
Presenter – Office of Faculty Development Grant Seekers’ Workshop: STEaM? Putting the 'A' in STEM at UMD? (with Dean Adrian Tio, 3/27/14)
Provost Search Committee (2012–2013)
Presenter – Office of Faculty Development session “Problem Solving, Writing, and Critical Thinking” – September 21, 2011
University Graduate Council (2011 – present)
University Graduate Council, Doctoral Subcommittee (2011 – present)
University Research Committee (2010 – present)
SEPPCE Dean Search Committee (2011)

MEMEBERSHIP IN PROFESSIONAL SOCIETIES (last 5 years)

National Organizations

Association of Mathematics Teacher Educators (2013-present)
American Educational Research Association (1996-present)

- Member of the Research on Mathematics Education Special Interest Group
- Member of Advanced Technologies for Learning /Learning Sciences Special Interest Group
- Past member of Problem-Based Learning Special Interest Group
- Past member of Instructional Technology Special Interest Group
- Member of Division C, 1996-present

International Society of the Learning Sciences (2002-present)
International Society for Quantitative Ethnography (2022-present)
National Council of Teachers of Mathematics (2006-present)
Psychology of Mathematics Education – North American Chapter (2008–present)

Psychology of Mathematics Education (2018–present)

Research Council on Mathematics Learning (2021 – present)

State Organizations

MACTE, 2013 - present

MassMATE, 2014 – present

New England Learning Sciences, 2017 – present

MassCUE, 2018 – present

ATMIM (ATMNE), 2018 – present

NE-COMMIT, 2021 – present