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Education

Ph.D.	**2001**	University of Wisconsin-Madison Thomas A. Romberg, Advisor	Curriculum & Instruction (Math Ed.) Minor: Educational Administration
M.A.	**1994**	University of California, Santa Barbara	Education (Confluent/Math Educ)
B.Sc.	**1988**	University of California, Los Angeles	Applied Mathematics

Professional Positions

University Positions

2012–present, Associate Professor, University of Colorado Boulder
2003–present, Executive Director, Freudenthal Institute US
2019, Interim SOE Associate Dean for Research, University of Colorado Boulder
2005–2012, Assistant Professor, University of Colorado Boulder
2003–2005, Associate Researcher, University of Wisconsin-Madison
2003–2004, Lecturer, Curriculum and Instruction, University of Wisconsin-Madison
2001–2003, Assistant Researcher, University of Wisconsin-Madison
1995–2001, Project Assistant, University of Wisconsin-Madison
1996–1997, University Supervisor, Secondary Mathematics, University of Wisconsin-Madison

Secondary and Middle Grades Mathematics Teaching

1992–1995, La Colina Middle School, Santa Barbara, California
1989–1992, Narbonne High School, Los Angeles, California

Courses Taught (Bold = developed original syllabus)
+ = co-taught; ^ = conference program; ***** = online; & = hybrid

EDUC 5317&*	Perspectives on Mathematics/Math Education	(Fall '05 –'11,'13 – '23)
EDUC 5830*	Teaching K-12 Mathematics: Geometric Thinking	(Sum '15, Fall19,20,23)
EDUC 4706/5706&*	Assessment in Math & Science Education	(Spr '07–'19, '21-'23)
EDUC 5820*	Teaching K-12 Mathematics: Algebraic Thinking	(Sum '12, '16, '18)
EDUC 8165/8175/8177	Curriculum and Policy in Math/Sci	(Spr '18, Spr '22)
EDUC 6804*	Designing Student Centered STEM Instruction	(Sum '14)
EDUC 8165/8175	Research on Tch Lrn & Practice in STEM Ed	(Spr '14)
EDUC 4060/5060	Classroom Interactions	(Fall '13, '21)
EDUC 8740+	Advances in the Assessment of Student Learning	(Fall '06, '08, '10)
EDUC 8165	Synthesis/Design of Rsrch Stdnt Lrning of Algebra	(Fall '11)
EDUC 6804+	Student Centered Secondary Mathematics	(Sum '11)
MATH 3120+	Functions and Modeling	(Fall '09)
GRTE 5020^	Progressive Formalization	(Fall '09)
EDUC 6804+	BPEME: Mathematical Understanding	(Sum '08)

EDUC 6804+	BPEME: Algebraic Reasoning	(Sum '07)
EDUC 6804+	BPEME: Proportional Reasoning	(Sum '06)
EDUC 5375	Methods & Materials in Secondary Mathematics	(Spr '06)

Publications: Articles and Conference Proceedings (* = peer reviewed)

* Webb, D. C. (in review). The Role of Educational Games as an Instructional Context to Promote Executive Function Processes in Mathematics Education. *Proceedings of the 47th Conference of the International Group for the Psychology of Mathematics Education*, Aukland, New Zealand.

* Webb, D. C. (accepted). Computational Thinking Patterns as Opportunities for Mathematics Learning in Computer Science Education. *Proceedings of the 15th International Congress of Mathematics Education*, Sydney, Australia.

* Webb, D. C., & Karanevich, P. (accepted). Student Interests and Teacher Commitments: Negotiating Iterative Co-Design of an Innovative Mathematics Curriculum Integrating Executive Function Processes. *Proceedings of the 15th International Congress of Mathematics Education*, Sydney, Australia.

* Karanevich, P., & Webb, D. C. (accepted). An Early Secondary Mathematics Curriculum Incorporating Student Interest and Games. *Proceedings of the 15th International Congress of Mathematics Education*, Sydney, Australia.

* Webb, D. C. (2023). Potential Opportunities and Challenges in the Integration of Executive Function Processes in Mathematics Education. In M. Ayalon, B. Koichu, R. Leikin, L. Rubel & M. Tabach (Eds.), *Proceedings of the 46th Conference of the International Group for the Psychology of Mathematics Education* (Vol. 1, p. 346). University of Haifa, Israel.

* Webb, D. C. (2022). The pandemic as a catalyst for rethinking active learning practices in technology intensive instructional environments. *International Journal of Mathematical Education in Science and Technology*, 53(3), 1-7. (https://doi.org/10.1080/0020739X.2021.1994665)

* Johnson, J. H., Moore-Russo, D., Wakefield, N., Webb, D. C. (2022). The Impact of the COVID Pandemic on Departmental Efforts to Implement Active Learning in Precalculus through Calculus 2 Courses. In S.S. Karunakaran & A. Higgins (Eds.), *Proceedings of the 24th Annual Conference on Research in Undergraduate Mathematics Education* (pp. 287 – 294). Boston, MA.

* Webb, D. C. (2021). The Design and Use of Low Instructional Overhead Tasks in Undergraduate Calculus: Making Student Reasoning More Accessible to Calculus Instructors. *Proceedings of the 14th International Congress of Mathematics Education*, Shanghai, China.

Webb, D. C. (2021). 危機を触媒に: パンデミック後の世界における数学教育の目的と実践の再考のために. 日本数学教育学会高専・大学部会論文誌= (Crises as catalysts: Rethinking the purpose and practice of mathematics education in a post-pandemic world). *Transactions of mathematical education for colleges and universities*, *27*(1), 1-8. [invited preface for the journal of the Japanese Society for Mathematics Education]

* Webb, D.C. (2019). Using Assessment Frameworks to Inform the Design of Classroom Assessment. In W.M. Smith, K.M. Callahan, J.F. Strayer, R.S. Jones & L.C. Augustyn (Eds.). *Proceedings of the eighth annual Mathematics Teacher Education Partnership conference*. Washington, DC: Association of Public Land-grant Universities.

* Bush, J.B., Webb, D.C., Kress, N.E., Yang, W. & Perkins, K.K. (2018). *Classroom Activities for Digital Interactive Simulations to Support Realistic Mathematics Education.* In Proceedings of the 6th International Realistic Mathematics Education Conference, Grand Cayman, Cayman Islands.

* Webb, D.C., Nickerson, H., & Bush, J.B. (2017). A comparative analysis of online and face-to-face professional development models for CS education. *Proceedings of the 48th ACM technical symposium on Computer Science Education - SIGCSE '17* (pp. 621 – 626). Seattle, WA. (doi>10.1145/3017680.3017784)

* Webb, D.C. (2016). Applying Principles for Active Learning to Promote Student Engagement in Undergraduate Calculus. *Proceedings of the 13th International Congress of Mathematics Education*, Hamburg, Germany.

Webb, D.C. (2016). Actively Learning Mathematics. In B. R. Lawler, B. Ronau, & M.J. Mohr-Schroeder (Eds.). Proceedings of the 5th Annual Mathematics Teacher Education Partnership Conference. Atlanta, GA: Association of Public Land-grant Universities.

* Gray, K. E., Webb, D. C., & Otero, V. K. (2016). Effects of the learning assistant model on teacher practice. *Physical Review Physics Education Research, 12*(2), 1-10.

* Webb, D.C. & Miller, S.B. (2015). *Gender Analysis of a Large Scale Survey of Middle Grades Students' Conceptions of Computer Science Education*. In Proceedings of the 3rd Conference on Gender IT (pp. 1-8). University of Pennsylvania: Philadelphia, PA. (doi>10.1145/2807565.2807706)

* Repenning, A., Webb, D. C., Koh, K. H., Nickerson, H., Miller, S. B., Brand, C., Her Many Horses, I., Basawapatna, A., Gluck, F., Grover, R., Gutierrez, K. & Repenning, N. (2015). *Scalable Game Design: A Strategy to Bring Systemic Computer Science Education to Schools through Game Design and Simulation Creation. ACM Transactions on Computing Education* (TOCE), 15(2), 1-34. (doi>10.1145/2700517)

* Miller, S.B. & Webb, D.C. (2015). *Game Design: Whose game works at the end of the day*? In Proceedings of the 3rd Conference on Gender IT (pp. 53-56). University of Pennsylvania: Philadelphia, PA. (doi: 10.1145/2807565.2807714)

* Webb, D. C., Stade, E., & Grover, R. (2014). Rousing Students' Minds in Post Secondary Mathematics: The Undergraduate Learning Assistant Model. *Journal of Mathematics Education at Teachers College, 5*(2), 39-47.

Webb, D. C. (2014). Reasoning and Representation in the Elementary Grades: Two Perspectives on Assessing the Standards for Mathematical Practice. *New England Mathematics Journal, 46*, 6-24.

Webb, D. C. (2014). Reconsidering Design and Use of Classroom Assessment in the Era of the Common Core Standards (Guest Editorial). *New England Math Journal, 46*, 3-4.

* Repenning, A., Webb, D. C., Brand, C., Gluck, F., Grover, R., Miller, S., Nickerson, H., & Song, M. (2014). Beyond Minecraft: Facilitating Computational Thinking through

Modeling and Programming in 3D. *IEEE Computer Graphics and Applications, 34*(3), 68-71.

* Webb, D. C. (2012). Teacher Change in Classroom Assessment: The Role of Teacher Content Knowledge in the Design and Use of Productive Classroom Assessment. *Proceedings of the 12th International Congress of Mathematics Education*, Seoul, South Korea.

* Webb, D. C., Repenning, A., & Koh, K. H. (2012). Toward an Emergent Theory of Broadening Participation in Computer Science Education. *Proceedings of the 43rd ACM technical symposium on Computer Science Education - SIGCSE '12* (pp. 173 – 178). Raleigh, NC. (doi>10.1145/2157136.2157191)

* Webb, D. C., van der Kooij, H., & Geist, M. (2011). Design Research in the Netherlands: Introducing Logarithms using Realistic Mathematics Education. *Journal for Mathematics Education at Teachers College, 2*(1)*,* 47-52.

* Basawapatna, A., Koh, K. H., Repenning, A., Webb, D. C., & Marshall, K. S. (2011). Recognizing computational thinking patterns. In *Proceedings of the 42nd ACM technical symposium on Computer science education* (pp. 245-250). Dallas, TX. (doi>10.1145/1953163.1953241)

* Repenning, A., Ahmadi, N., Repenning, N., Ioannidou, A, Webb, D. C., & Marshall, K. (2011). Collective Programming: Making End-User Programming (More) Social. *Lecture Notes in Computer Science, 6654*, 325-330.

* Webb, D. C. (2010a). Troubleshooting Assessment: An Authentic Problem Solving Activity for IT Education. *Procedia – Social and Behavioral Sciences, 9*, 903-907.

* Webb, D. C. (2010b). Collaborative Design of Instructional Sequences: Teacher Developed Support for Formative Assessment. *Procedia – Social and Behavioral Sciences, 9*, 153-157.

* Repenning, A., Webb, D., & Ioannidou, A. (2010). Scalable game design and the development of a checklist for getting computational thinking into public schools. In *Proceedings of the 41st ACM technical symposium on Computer science education* (pp. 265-269). Milwaukee, WI. (doi>10.1145/1734263.1734357)

* Ioannidou, A., Repenning, A., Webb, D. C., Luhn, L., Keyser, D., & Daetwyler, C. (2010). Mr. Vetro: a Collective Simulation Framework for Teaching Health Science. *International Journal of Computer Supported Collaborative Learning, 5*(2), 141-166.

* Dekker, T., & Webb, D. C. (2009). Beter toetsen, beter leren? [Better tests, better learning?] *Wiskrant, 23*(8), 43-48.

* Webb, D. C. (2009). Designing professional development for assessment. *Educational Designer, 1*(2), 1-26. [Retrieved from: http://www.educationaldesigner.org/ed/volume1/issue2/article6]

* Ioannidou, A., Repenning, A., & Webb, D. C. (2009). AgentCubes: Incremental 3D End-User Development. *Journal of Visual Languages and Computing, 20*(4), 236-251.

* Webb, D. C., Boswinkel, N., & Dekker, T. (2008). Beneath the Tip of the Iceberg: Using Representations to Support Student Understanding. *Mathematics Teaching in the Middle School, 14*(2), 110-113.

* Dekker, T., & Webb, D. C. (2004). Toetsen op niveau [Higher level tests]. *Tijdschrift voor Didactiek der B-wetenschappen* [Journal for Instructional Science], *21*(1).

* Webb, D. C., & Dekker, T. (2002). Classroom Assessment as a Basis for Teacher Change (CATCH). In D. S. Mewborn, Sztajn, P., White, D. Y., Wiegel, H. G., Bryant, R. L., & K. Nooney (Eds.), *Proceedings of the twenty-fourth Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (Vol. II, pp. 599-609). Columbus, OH: ERIC Clearinghouse for Science, Mathematics, and Environmental Education.

* Webb, D. C., & Romberg, T. A. (1998). Preliminary results of an assessment using NAEP and TIMSS mathematics items for program evaluation. In S. B. Berenson, Dawkins, K.R., Blanton, M., Coulombe, W.N., Kolb, J., Norwood, K., & L. Stiff (Eds.), *Proceedings of the twentieth Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (Vol. I, pp. 220). Columbus, OH: ERIC Clearinghouse for Science, Mathematics, and Environmental Education.

* Brenner, M.E., Mayer, R. E., Moseley, B., Duran, R., Brar, T., Smith, B. R., & Webb, D. (1997). The Role of Multiple Representations in Learning Algebra. *American Educational Research Journal, 34*(4), 663-689.

* Webb, D.C., & Wortham, D.W. (1996). A Comparative Study of Two Remediation Strategies for Proportion Problems. In E. Jakubowski, D. Watkins, and H. Biske (Eds.), *Proceedings of the eighteenth Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (pp. 330-335) Columbus, OH: ERIC Clearinghouse for Science, Mathematics, and Environmental Science.

Publications: Books

* Smith, W. S., Voigt, M., Ström, A., Webb, D. C., & Martin, W. G. (Eds) (2021). *Transformational Change Efforts: Student Engagement in Mathematics through an Institutional Network for Active Learning*. St. Paul, MN: American Mathematical Society & Conference Board of the Mathematical Sciences.

Forward for book: Harris, P. W. (2011). *Building Powerful Numeracy for Middle and High School Students*. Portsmouth, NH: Heinemann

Webb, D. C. (2010). *Discourse Based Assessment in the Mathematics Classroom: A study of teachers' instructionally embedded assessment practices*. Saarbrücken, Germany: Lambert Academic Publishing.

Meyer, M.R., Langrall, C., Arbaugh, F., Webb, D.C., & Hoover, M. (Eds.) (2008). *Lessons Learned in Implementing Mathematics Curricula: Ten Years of the ShowMe Project.* Charlotte, NC: Information Age Publishing, Inc.

Publications: Encyclopaedia, Dictionary, and Short Reference Entries

Webb, D. C. (2014). Bloom's Taxonomy in Mathematics Education. In S. Lerman (Ed.), *Encyclopedia of Mathematics Education* (pp. 63-68). Dordrecht, The Netherlands: Springer Science+Business Media.

Publications: Book Chapters (* = refereed)

* Webb, D. C. (2023). The pandemic as a catalyst for rethinking active learning practices in technology intensive instructional environments. In K. Seaton, B. Loch & E. Lugosi (Eds.), *Takeaways from Teaching through a Pandemic* (pp. 170-176). Routledge.

* Smith, W. M., Voigt, M., Martinez, A., Rasmussen, C., Funk, R., Webb, D. C., & Ström, A. (2022). Drivers and Strategies that Lead to Sustainable Change in the Teaching and Learning of Calculus within a Networked Improvement Community. In R. Beihler, G. Gueudet, M. Liebendörfer, C. Rasmussen & C. Winsløw (Eds)., *Practice-Oriented Research in Tertiary Mathematics Education*, Advances in Mathematics Education (pp. 369 – 390). Springer.

* Webb, D.C & Tubbs, R. (2021). Grassroots University: Building Capacity through a Sustained Commitment to Instructional Innovation. In W.M. Smith, M. Voigt, A. Ström, D. C. Webb & W. G. Martin, (Eds.), *Transformational Change Efforts: Student Engagement in Mathematics through an Institutional Network for Active Learning*. St. Paul, MN: American Mathematical Society & Conference Board of the Mathematical Sciences.

* Webb, D.C., Funk, R., Uhing, K, & Bowers, J. (2021). Use of resources to support active learning. In W.M. Smith, M. Voigt, A. Ström, D. C. Webb & W. G. Martin, (Eds.), *Transformational Change Efforts: Student Engagement in Mathematics through an Institutional Network for Active Learning*. St. Paul, MN: American Mathematical Society & Conference Board of the Mathematical Sciences.

* Strom, A., Webb, D.C., Voigt, M., & Funk, R. (2021). Active Learning Mathematics. In W.M. Smith, M. Voigt, A. Ström, D. C. Webb & W. G. Martin, (Eds.), *Transformational Change Efforts: Student Engagement in Mathematics through an Institutional Network for Active Learning.* St. Paul, MN: American Mathematical Society & Conference Board of the Mathematical Sciences.

* Uhing, K., Webb, D.C., Wakefield, N., Donsig, A., & Rasmussen, C. (2021). Professional development to support active learning. In W.M. Smith, M. Voigt, A. Ström, D. C. Webb & W. G. Martin, (Eds*.), Transformational Change Efforts: Student Engagement in Mathematics through an Institutional Network for Active Learning*. St. Paul, MN: American Mathematical Society & Conference Board of the Mathematical Sciences.

* Ronau, R., Webb, D. C., Peters, S. A., Mohr-Schroeder, M. & Stade, E. (2020). Mathematical Preparation of Secondary Mathematics Teacher Candidates. In W. G. Martin, B. R. Lawler, A. E. Lischka & W. M. Smith (Eds.), *The Mathematics Teacher Education Partnership: The Power of a Networked Improvement Community to Transform Secondary Mathematics Teacher Preparation* (pp. 91-118). Charlotte, NC: Information Age Publishing.

* Webb, D.C., & Peck, F. (2020). From tinkering to systemic innovation: The role of teachers in the guided redesign of mathematics education in the United States. In M. van den Heuvel-Panhuizen, P. Drijvers, M. Doorman, M. van Zanten (Eds.), Reflections from abroad on the Netherlands didactic tradition in mathematics education. Utrecht, the Netherlands: Freudenthal Institute Faculty of Science, Utrecht University.

* Webb, D.C. (2017). The Iceberg Model: Rethinking Mathematics Instruction from a Student Perspective. In L. West & M. Boston (Eds.), *Annual Perspectives in Mathematics*

Education: *Reflective and Collaborative Processes to Improve Mathematics Teaching*. Reston, VA: NCTM

Webb, D. C., & Abels, M. (2011). Restrictions in algebra. In P. Drijvers (Ed.) *Secondary algebra education: Revisiting topics and themes and exploring the unknown* (pp. 101-118). Boston, MA: Sense Publishers.

Webb, D. C. (2008). Design Principles for Professional Development: What Should Teachers Know about Mathematics in Context? In M.R. Meyer, C. Langrall, F. Arbaugh, D.C. Webb & M. Hoover (Eds.), *Lessons Learned in Implementing Mathematics Curricula: Ten Years of the ShowMe Project* (pp. 161-171). Charlotte, NC: Information Age Publishing, Inc.

Webb, D.C., & Meyer, M.R. (2007). The Case of Mathematics in Context. In Christian Hirsch (Ed.), *Perspectives on Design and Development of School Mathematics Curricula* (pp. 81 – 94). Reston, VA: NCTM.

* Webb, D. C., Romberg, T. A., Burrill, J., & Ford, M. J. (2005). Teacher Collaboration: Focusing on Problems of Practice. In T. A. Romberg & T. P. Carpenter (Eds.), *Understanding Math and Science Matters* (pp. 231-251). Mahwah. NJ: Lawrence Erlbaum Associates.

Webb, D. C. (2004). Enriching Assessment Opportunities Through Classroom Discourse. In T. A. Romberg (Ed.), *Standards-Based Mathematics Assessment in Middle School: Rethinking Classroom Practice* (pp. 169-187). New York: Teachers College Press.

Webb, D. C., Romberg, T. A., Dekker, T., de Lange, J., & Abels, M. (2004). Classroom Assessment as a Basis for Teacher Change. In T. A. Romberg (Ed.), *Standards-Based Mathematics Assessment in Middle School: Rethinking Classroom Practice* (pp. 223-235). New York: Teachers College Press.

Her, T., & Webb, D. C. (2004). Retracing a Path to Assessing for Understanding. In T. A. Romberg (Ed.), *Standards-Based Mathematics Assessment in Middle School: Rethinking Classroom Practice* (pp. 200-220). New York: Teachers College Press.

Publications: Curriculum Development, Teacher Guides

Chaffin, C., Smith, C., Repenning, N., & Webb, D. C. (2023). Major revision of Course 1 for Scalable Game Design (Frogger and Journey). An Online Professional Development Course for Teachers for the eSTEM Designing Games for Education project. Columbia, MO: eMINTS.

Chaffin, C., Smith, C., Repenning, N., & Webb, D. C. (2023). Major revision of Course 2 for Scalable Game Design (Pacman and Predator/Prey). An Online Professional Development Course for Teachers for the eSTEM Designing Games for Education project. Columbia, MO: eMINTS.

Webb, D. C., Hartzell, M., Karanevich, P., Katz, B., Davidson, J., et al. (2022). Expressions and Equations: A Spark Math Algebra Unit (Modularized Edition). https://www.sparkmath.org/units/unit-3

Webb, D. C., Wyberg, T., McGarry, A., Katz, B., Davidson, J., et al. (2022). Making Sense of Ratios: A Spark Math Rational Number Unit. https://www.sparkmath.org/units/unit-2

Webb, D. C., Karanevich, P., Becker, M., Zengilowski, A., McGarry, A., et al. (2022). Statistics: A Spark Math Introductory Statistics Unit. https://www.sparkmath.org/units/unit-4

Chaffin, C., Smith, C., Repenning, N., & Webb, D. C. (2022). Course 1 for Scalable Game Design (Frogger and Pacman). An Online Professional Development Course for Teachers for the eSTEM Designing Games for Education project. Columbia, MO: eMINTS.

Chaffin, C., Smith, C., Repenning, N., & Webb, D. C. (2022). Course 2 for Scalable Game Design (Adv Pacman and Predator/Prey). An Online Professional Development Course for Teachers for the eSTEM Designing Games for Education project. Columbia, MO: eMINTS.

Webb, D. C., Hartzell, M., Karanevich, P., Becker, M., et al. (2021). Expressions and Equations: A Spark Math Algebra Unit (Pilot Edition).

Bastian, B., Brown, K., Combs, S., Heldman, W., Petersen, B., Powell, C., Reitzig, A., Webb, D. C., Young, A. (2018). *Colorado Academic Standards for Computer Science*. Denver, CO: Colorado Department of Education.

Co-author of select calculus materials to support Active Learning in Undergraduate Mathematics. See http://math.colorado.edu/activecalc/

Webb, D.C., Hedges, T., Dekker, T., & Wijers, M. (2006/2010). Expressions and Formulas using Algebra Applets [Teacher Guide]. In Wisconsin Center for Education Research & Freudenthal Institute (Eds.), Mathematics in Context. Chicago: Encyclopaedia Britannica, Inc.

Webb, D.C., Cole, B.R., Wijers, M., de Haan, D., & Pahla, S. (2006/2010). Dealing with Data using Tinkerplots [Teacher Guide]. In Wisconsin Center for Education Research & Freudenthal Institute (Eds.), Mathematics in Context. Chicago: Encyclopaedia Britannica, Inc.

Webb, D. C., Hedges, T., Abels, M., & Dekker, T. (2006/2010). Per Sense [Teacher Guide]. In Wisconsin Center for Education Research & Freudenthal Institute (Eds.), Mathematics in Context. Chicago: Encyclopaedia Britannica, Inc.

Webb, D. C., Hedges, T., Abels, M., & Dekker, T. (2006/2010). Some of the Parts [Teacher Guide]. In Wisconsin Center for Education Research & Freudenthal Institute (Eds.), Mathematics in Context. Chicago: Encyclopaedia Britannica, Inc.

Webb, D. C., Hedges, T., Wijers, M., & Dekker, T. (2006/2010). Dimes and Decimals [Teacher Guide]. In Wisconsin Center for Education Research & Freudenthal Institute (Eds.), Mathematics in Context. Chicago: Encyclopaedia Britannica, Inc.

Webb, D. C., Hedges, T., Wijers, M., & Dekker, T. (2006/2010). Patterns and Symbols [Teacher Guide]. In Wisconsin Center for Education Research & Freudenthal Institute (Eds.), Mathematics in Context. Chicago: Encyclopaedia Britannica, Inc.

Webb, D.C., Ailts, S., Vettrus, J., Feijs, E., & De Lange, J. (2006/2010). Looking at an Angle [Teacher Guide]. In Wisconsin Center for Education Research & Freudenthal Institute (Eds.), Mathematics in Context. Chicago: Encyclopaedia Britannica, Inc.

Webb, D.C., Ailts, S., Vettrus, J., Wijers, M., & Dekker, T. (2006/2010). Second Chance [Teacher Guide]. In Wisconsin Center for Education Research & Freudenthal Institute (Eds.), Mathematics in Context. Chicago: Encyclopaedia Britannica, Inc.

Webb, D.C., Cole, B.R., Abels, M., & de Haan, D. (2006/2010). More or Less [Teacher Guide]. In Wisconsin Center for Education Research & Freudenthal Institute (Eds.), Mathematics in Context. Chicago: Encyclopaedia Britannica, Inc.

Webb, D.C., Cole, B.R., Wijers, M., de Haan, D., & Pahla, S. (2006/2010). Dealing with Data [Teacher Guide]. In Wisconsin Center for Education Research & Freudenthal Institute (Eds.), Mathematics in Context. Chicago: Encyclopaedia Britannica, Inc.

Webb, D.C., Cole, B.R., Wijers, M., Dekker, T., & Pahla, S. (2006/2010). Great Predictions [Teacher Guide]. In Wisconsin Center for Education Research & Freudenthal Institute (Eds.), Mathematics in Context. Chicago: Encyclopaedia Britannica, Inc.

Webb, D.C., Cole, B.R., Wijers, M., Feijs, E., & Dekker, T. (2006/2010). Ratios and Rates [Teacher Guide]. In Wisconsin Center for Education Research & Freudenthal Institute (Eds.), Mathematics in Context. Chicago: Encyclopaedia Britannica, Inc.

Webb, D.C., Hazlett, E., Park, A., Abels, M., Feijs, E., & Dekker, T. (2006/2010). Packages and Polygons [Teacher Guide]. In Wisconsin Center for Education Research & Freudenthal Institute (Eds.), Mathematics in Context. Chicago: Encyclopaedia Britannica, Inc.

Webb, D.C., Hedges, T., & Abels, M. (2006/2010). Comparing Quantities [Teacher Guide]. In Wisconsin Center for Education Research & Freudenthal Institute (Eds.), Mathematics in Context. Chicago: Encyclopaedia Britannica, Inc.

Webb, D.C., Hedges, T., & Dekker, T. (2006/2010). Made to Measure [Teacher Guide]. In Wisconsin Center for Education Research & Freudenthal Institute (Eds.), Mathematics in Context. Chicago: Encyclopaedia Britannica, Inc.

Webb, D.C., Hedges, T., Abels, M., & Dekker, T. (2006/2010). Fraction Times [Teacher Guide]. In Wisconsin Center for Education Research & Freudenthal Institute (Eds.), Mathematics in Context. Chicago: Encyclopaedia Britannica, Inc.

Webb, D.C., Hedges, T., Abels, M., & Pahla, S. (2006/2010). Models You Can Count On [Teacher Guide]. In Wisconsin Center for Education Research & Freudenthal Institute (Eds.), Mathematics in Context. Chicago: Encyclopaedia Britannica, Inc.

Webb, D.C., Hedges, T., Dekker, T., & Wijers, M. (2006/2010). Expressions and Formulas [Teacher Guide]. In Wisconsin Center for Education Research & Freudenthal Institute (Eds.), Mathematics in Context. Chicago: Encyclopaedia Britannica, Inc.

Webb, D.C., Hedges, T., Dekker, T., & Wijers, M. (2006/2010). Take a Chance [Teacher Guide]. In Wisconsin Center for Education Research & Freudenthal Institute (Eds.), Mathematics in Context. Chicago: Encyclopaedia Britannica, Inc.

Webb, D.C., Hedges, T., Dekker, T., Palha, S., & McGrath, E. (2006/2010). Building Formulas [Teacher Guide]. In Wisconsin Center for Education Research & Freudenthal Institute (Eds.), Mathematics in Context. Chicago: Encyclopaedia Britannica, Inc.

Webb, D.C., Hedges, T., Hoiberg, K., Dekker, T., and Wijers, M. (2006/2010). Picturing Numbers [Teacher Guide]. In Wisconsin Center for Education Research & Freudenthal Institute (Eds.), Mathematics in Context. Chicago: Encyclopaedia Britannica, Inc.

Webb, D.C., Hoiberg, K., Feijs, E., & De Lange, J. (2006/2010). Figuring All the Angles [Teacher Guide]. In Wisconsin Center for Education Research & Freudenthal Institute (Eds.), Mathematics in Context. Chicago: Encyclopaedia Britannica, Inc.

Webb, D.C., Johnson, C., Dekker, T., & Kindt, M. (2006/2010). Algebra Rules! [Teacher Guide]. In Wisconsin Center for Education Research & Freudenthal Institute (Eds.), Mathematics in Context. Chicago: Encyclopaedia Britannica, Inc.

Webb, D.C., Krusi, J., Abels, M., & Wijers, M. (2006/2010). Revisiting Numbers [Teacher Guide]. In Wisconsin Center for Education Research & Freudenthal Institute (Eds.), Mathematics in Context. Chicago: Encyclopaedia Britannica, Inc.

Webb, D.C., Krusi, J., Palha, S., & Dekker, T. (2006/2010). Patterns and Figures[Teacher Guide]. In Wisconsin Center for Education Research & Freudenthal Institute (Eds.), Mathematics in Context. Chicago: Encyclopaedia Britannica, Inc.

Webb, D.C., Krusi, J., Wijers, M., & de Haan, D. (2006/2010). Graphing Equations [Teacher Guide]. In Wisconsin Center for Education Research & Freudenthal Institute (Eds.), Mathematics in Context. Chicago: Encyclopaedia Britannica, Inc.

Webb, D.C., McGrath, E., & Abels, M.(2006/2010). Triangles and Beyond [Teacher Guide]. In Wisconsin Center for Education Research & Freudenthal Institute (Eds.), Mathematics in Context. Chicago: Encyclopaedia Britannica, Inc.

Webb, D.C., McGrath, E., Feijs, E., de Lange, J., & Dekker, T. (2006/2010). It's All the Same [Teacher Guide]. In Wisconsin Center for Education Research & Freudenthal Institute (Eds.), Mathematics in Context. Chicago: Encyclopaedia Britannica, Inc.

Webb, D.C., McGrath, E., Wijers, M., de Haan, D., & Feijs, E. (2006/2010). Insights into Data [Teacher Guide]. In Wisconsin Center for Education Research & Freudenthal Institute (Eds.), Mathematics in Context. Chicago: Encyclopaedia Britannica, Inc.

Webb, D.C., Park, A., Hazlett, E., Dekker, T., & Kindt, M. (2006/2010). Operations [Teacher Guide]. In Wisconsin Center for Education Research & Freudenthal Institute (Eds.), Mathematics in Context. Chicago: Encyclopaedia Britannica, Inc.

Webb, D.C., Rappaport, B., Abels, M., & Dekker, T. (2006/2010). Ups and Downs [Teacher Guide]. In Wisconsin Center for Education Research & Freudenthal Institute (Eds.), Mathematics in Context. Chicago: Encyclopaedia Britannica, Inc.

Webb, D.C., Ulmer, C., & Abels, M. (2006/2010). Facts and Factors [Teacher Guide]. In Wisconsin Center for Education Research & Freudenthal Institute (Eds.), Mathematics in Context. Chicago: Encyclopaedia Britannica, Inc.

Webb, D.C., Ulmer, C., Abels, M., & Dekker, T. (2006/2010). Reallotment [Teacher Guide]. In Wisconsin Center for Education Research & Freudenthal Institute (Eds.), Mathematics in Context. Chicago: Encyclopaedia Britannica, Inc.

Publications: Other Instructional Materials

McGarry, A., Findley, K., Hartzell, M., Perkins, K., Webb, D. C., Klusendorf, C., & Reid, S. (2021). *Center and Spread*. A Mathematics PhET sim for K-12 education.

McGarry, A., Paul, A., Price, A., Stade, B., Webb, D.C., & Malley, C. (2018). *Equality Explorer*. A Mathematics PhET applet for K-12 education.

McGarry, A., Perkins, K., Price, A., Stade, B., & Webb, D.C. (2016). *Balancing Equations*. A Mathematics PhET applet for K-12 education.

McGarry, A., Blanco, J., Webb, D.C., Perkins, K. & Paul, A. (2015). *Expression Exchange*. A Mathematics PhET applet for K-12 education.

McGarry, A., Hensberry, K., Reid, S., Webb, D.C., Paul, A., Perkins, K. (2014) *Function Builder*. A Mathematics PhET applet for K-12 education.

Dekker, T., Querelle, N., Meyer, M. R., Webb, D. C., Shafer, M. C., Burrill, J., & Pligge, M. A. (2000). *Balanced Unit Assessments* (Grades 5–8). Chicago: Encyclopaedia Britannica, Inc.

Funded Activities

PI on subaward for Spark Math: Igniting the Next Generation of Powerful Learners, EF+Math Program (efmathprogram.org), Total Award $2.7 million (subaward $282K), August 2020-2023.

PI on NSF IUSE "Characteristics of Equitable Mathematics Programs" $300K total award, 3/1/20-8/31/23 (co-PI Nancy Kress and David Grant).

PI on NSF IUSE “SEMINAL: Student Engagement through an Institutional Network for Active Learning” $3.0 million total award, 9/1/16-2/28/23. SEMINAL supplement proposal was awarded March 2020 for an additional $600K.

Senior personnel on Internal WISE grant " Professional learning for supporting students in making sense of the world using mathematics" $11K. (through Summer 2023).

co-PI on NSF IUSE "Change in Departments and Institutions via Active Learning" conference proposal. March 2020-2022, $100K.

Key personnel on IES early phase STEM grant, "eSTEM Designing Games for Education (eDGE): Giving Students the eDGE." Design of instructional materials integrating computer science and mathematics for implementation in Grade 5 rural communities. PI Carla Chaffin ($3,932,000 total award from Dec 2020-2025)

Senior personnel on Gates Foundation grant "Peer to Peer Collaborative Learning Software for Middle School Math Classrooms" Includes part time funding for two GRAs. (through Summer 2020).

Senior personnel on IES grant "A Novel Platform for High-Quality Formative Assessment in Mathematics." PI Brent Milne ($900K total award from 5/10/18 - 5/9/20)

Co-PI on NSF DRK12 "Teaching and Learning Algebraic Thinking Across the Middle Grades: A Research-based Approach Using PhET Interactive Simulations" $2.2 million total award, 8/1/15-7/31/19.

Co-PI on NSF ITEST “oDREAMS: Promoting Computational Thinking through Game & Simulation Design” $2.0 million total award, 8/1/13-7/31/18.

Co-PI on Google Inc., Google RISE Award, Scalable Game Design NATIVE, $25,000, Computer Science Education through Scalable Game Design for Native American Tribes.

PI on Leona M. and Harry B. Helmsley Charitable Trust sub-award to redesign secondary mathematics teacher preparation programs. CU Subaward $85K, 1.5 years.

Senior personnel on NSF grant "Phase II: A Question of Numbers: Numeracy, Learning, and Learning about Learning" Research and evaluation. 1/1/15 – 6/30/16.

Senior personnel on NSF grant "Real Time Evaluation and Assessment of Computational Thinking (REACT)" Formative evaluation of teacher implementation, classroom practice, and student learning outcomes for this project. 1/1/14 – 6/30/14.

Senior personnel on NSF grant "Phase I: A Question of Numbers: Numeracy, Learning, and Learning about Learning" External evaluation. 1/1/14 – 12/31/14.

Co-PI on NSF CE21 award, “Computational Thinking for Teaching Computing: Validating a Theory of Broadening Participation,” $ 1,500,000 over 3 years (PI Alex Repenning), 1/1/2012 – 12/31/2014.

PI on subaward for the evaluation of NSF-funded SBIR Phase II: “Collective Programming Environment for the Social Exploration of Computational Thinking Through Games,” 8/15/11 – 7/31/13.

Co-PI on NSF subaward through NSF-funded I^3: Towards a Center for STEM Education, “Targeting the Technology Gender Gap: Making Computer Science Engaging and Accessible for All Students.” (one 25% doctoral student line), Fall 2011-Fall 2012.

PI on contract from Denver Public Schools: “DTR Secondary Mathematics Course Development,” $35,000 with possible extension, 1/15/2011-6/30/2012.

PI on subaward for the evaluation of NSF-funded SBIR Phase II: “Scalable Game Design: Broadening Computer Science Participation with Low-Threshold, High-Ceiling Design Environments,” 3/1/09 – 8/31/11.

PI on subaward for the evaluation of NSF-funded SBIR Phase I: “CyberCollage: A Collective Programming Environment for the Social Exploration of Computational Thinking through Games.” 7/1/10 – 12/31/10.

PI on NSF subaward through NSF-funded I^3: Towards a Center for STEM Education, “Developing the Learning Assistant Model for Calculus: Improving Access to Undergraduate STEM Education” (two 25% doctoral student lines), Fall 2010.

Co-PI on NSF ITEST award, “Strategies: Reforming IT Education through Game Design: Integrating Technology-Hub, Inner City, Rural and Remote Regions” $ 1,499,425 over 3 years (PI Alex Repenning), 1/1/2009 – 12/31/2011.

PI on award from University of Utrecht: "Freudenthal Institute USA." 200.000 euros total award, 4/1/2007 – 3/31/2012

Co-PI on NSF subaward through NSF-funded I^3: Towards a Center for STEM Education, "Developing the Learning Assistant Model for Calculus: Improving Access to Undergraduate STEM Education" (two 25% doctoral student lines in Year 1 with option for reapplication), Fall 2009 – Spring 2010.

Co-PI on research and development award from Boulder Valley School District, "BVSD Secondary Mathematics Development Collaborative in Technology and Algebra" $10,000 over 12 months, 7/1/2009 – 6/30/2010.

Co-PI on NSF Noyce award, "STEM Colorado/Noyce Teacher Scholarship Program" $500,000 over 4 years (PI Valerie Otero, co-PIs Mike Klymkowsky, Noah Finkelstein, Steven Pollock), 1/1/2009 – 12/31/2012.

Senior personnel on grant proposal awarded by the National Math and Science Initiative/Exxon Mobil : "CU-Teach" $2.4 million total award, 11/15/2007-10/31/2012 (PI Valerie Otero; co-PIs Mike Klymkowsky and Jennie Whitcomb)

Principal Investigator on subcontract award from NSF Show-ME Center II: "Studies of Professional Development and Methods for Assessing Student Understanding in the Middle Grades." $68,939 total award, 8/15/2005-6/30/2007

Co-PI on grant proposal awarded by the Colorado Department of Education: "Boulder Partnership for Excellence in Mathematics Education" $600,000 total award, 3/1/2006-8/31/2008. PI Bee Wallace (BVSD), co-PIs D.C.Webb, Jim Curry (Appl Math), & Truus Dekker (Freudenthal Inst).

Principal Investigator on contract award from DPS Math/Special Education department: "Impact of Dynamic Math Applets on Student Learning and Achievement." Supporting the study of the first US implementation of the Freudenthal Institute's Digital Math Environment in two underperforming middle schools in Denver. $5000 total, December 2007. This award was also designed to support the preparation of a grant proposal submitted June 2008.

Principal Investigator on seed grant award from Front Range Community College "Development of a transformed College Algebra unit for exponential and logarithmic functions" $1500 total award, October 2006. This award was also designed to support the preparation of a NSF CCLI Phase I grant proposal, submitted in May 2007 & 2008.

Co-PI on NSF Instructional Materials Development award, "Elementary, Secondary, and Informal Education: Revision of the 'Mathematics in Context' Materials" $1,690,000 over 3 years (PI Thomas Romberg), 12/15/2002 – 11/30/2005.

Awards and Honors

Digital Promise's Top Evaluation Research Award (for evaluation of Woot Math), 2016.

CU-LEAD Faculty Appreciation Award, 2011.

Chancellors Award for Excellence in STEM Education. Advisor for Doctoral Student Awards: Nancy Kress, 2017-18, Susan Miller, 2015-16, Krista Marshall, 2011-12, Ryan Grover and Louisa Harris, School of Education, 2009-10.

Fellow, International Society for Design and Development in Education, 2009 - present.

UCSB Chancellor's Award, 1994.

Professional Activities

International Service

Reviewed 9 proposals for the 15th International Congress of Mathematics Education Conference.

Reviewed 10 proposals for the 2023 International Society for Design and Development in Education Conference.

Editorial Board, Indonesian Mathematical Society Journal on Mathematics Education. June 2016 – present. https://ejournal.unsri.ac.id/index.php/jme/about/editorialTeam

Hosted visiting scholar and initial mobility exchange, Roman Hašek, November – December 2021, faculty at University of South Bohemia, Czech Republic.

Reviewed 2 proposals for the 14th International Congress of Mathematics Education Conference [Topic Study Group 13], Shanghai, China.

Member, Executive Board, International Society for Design and Development in Education. 4-year term (Dec 2016 – present)

Hosting visiting scholar, Liming Huang, September 2018 – November 2019, faculty at South China Normal University, Guangzhou, China.

Live interview on Cayman Radio One September 19, 2018, with Dwayne Ebanks and Frank Eade about Realistic Mathematics Education and ways to support improved mathematics education in Cayman Islands Schools.

Reviewed 12 proposals for the Sixth International Realistic Mathematics Education Conference (2018).

Hosted visiting scholar, Wanqiu Yang, October 2017 – October 2018, Ph.D. student at Northeast Normal University, Changchun, China.

Founding member, International Consortium for Realistic Mathematics Education.

Reviewed 1 proposal for the International Congress of Mathematics Education Conference (2016).

Chair of the 5th International Realistic Mathematics Education Conference (Sept 2015), Boulder, CO. *Attendees included math education faculty, teachers and educational leaders from the United States, Europe, Asia and Africa*.

Chair of the 11th Annual Conference of the International Society for Design and Development in Education (Sept 2015), Boulder, CO. *Attendees included research faculty and designers from industry from the United States, Europe, Asia and Africa*.

Hosted Visiting Scholar, Veronika Hubenakova, PhD. student at Institute of Mathematics, Faculty of Science, (Pavol Jozef Šafárik University in Košice, Slovakia, Spring/Summer 2014)

Hosted Visiting Scholar, Berenice Michels, Curriculum Developer at the Nationaal expertisecentrum leerplanontwikkeling (Dutch National Curriculum Center; Summer/Fall 2013).

Chair of the 4th International Realistic Mathematics Education Conference (Sep 27 - 29, 2013), Boulder, CO. *Attendees included math and science education faculty and educational leaders in the United States, Europe, Asia and Africa*.

Organized and facilitated full-day assessment symposium for 22 faculty, admin and teachers from University of Trondheim (Norway), University of Colorado Boulder, Colorado Department of Education, St Vrain Valley School District, and Boulder Valley School District (Sep '13).

Invited Organizing Team member of the International Congress for Mathematics Education Topic Study Group for Assessment and Testing (in Seoul, SK July 2012)

Coordinator of the 3rd International Realistic Mathematics Education Conference (Sep 23 - 25, 2011), Boulder, CO. *100+ university faculty, state and district administrators, graduate students, and teachers from United States, Europe, Africa, Australia and Asia participated.*

Hosted Visiting Scholar, Sutarto Hadi, Professor of mathematics education at the Lambung Mangkurat University, Banjarmasin, Indonesia (Fall 2010).

Coordinator of the 2nd International Realistic Mathematics Education Conference (Oct 12 – 14, 2009), Boulder, CO. Attended by 130+ university faculty, state and district administrators, graduate students, and teachers from the United States, Canada, Japan, Mexico, Netherlands, Nigeria and the United Kingdom.

Obama zet ramen open [Obama opens doors]. (2009, May). Didaktief [A Dutch general education magazine comparable to Education Week]. pp. 6, 7, 10. *Interview with journalist to develop an article for the Dutch teacher magazine, Didaktief. The article discusses the state of mathematics education in the US and the role of CU-Boulder's Freudenthal Institute USA*.

Fellow of the International Society for Design and Development in Education (2009 – present).

Reviewed 16 proposals for the Biennial European Association for Research on Learning and Instruction/Northumbria Assessment Conference (2008)

Coordinator of the 1st International Realistic Mathematics Education conference (Nov 14 - 15, 2005), Madison, WI. Attended by 120+ university faculty, state and district administrators, graduate students, and teachers from the United States, Canada, Great Britain, Italy and the Netherlands.

Invited by the American University of Beirut to review materials and submit a letter of evaluation for Dr. Marjorie Henningsen's application for promotion to Associate Professor.

U.S. Item Selection, OECD Programme for International Student Assessment

National Service

Advisory Board Member, Learning Probability through AI Problem-Solving in a Game-based Environment Project (PI Ning Wang, University of Southern California)

Planning Committee for the SEMINAL Change-DIAL 3-day hybrid conference, Lincoln, NE, May 2022.

Reviewer, three RUME'22 conference proposals

Planning Committee for Mathematical Sciences Research Institute Critical Issues in Mathematics Education 3-day hybrid workshop, Berkeley, CA, March 16-18, 2022

Invited Presentation of Spark Math co-design work to The International Mind, Brain, and Education Society (IMBES), August 2, 2021

Invited by University of South Dakota to review materials and submit a letter of evaluation for faculty for promotion to Full Professor.

Organizing Committee, Critical Issues in Mathematics Education 2021: Initiating, Sustaining, and Researching Mathematics Department Transformation of Introductory Courses for STEM Majors, Mathematical Sciences Research Institute. https://www.msri.org/workshops/1001

NSF Panelist for Historically Black Colleges and Universities; Targeted Infusion Panel (FEB 23 & 24, 2021)

Advisory Board Member, Creating a Model for Sustainable Ambitious Mathematics Programs in High-Need Settings: a Researcher-Practitioner Collaboration (NSF DRK12)

Advisory Board Member, NSF STEM+C grant " Positioning Youth for Success in Science: Studying the Malleability and Impact of Computational Thinking for Science" (2019-2021).

Discussant, NCME Classroom Assessment Conference, Boulder, CO (Sept 2019).

Round Table Presentation at Utah Association of Mathematics Teacher Educators (March 2019)

Member, Science and Mathematics Teaching Imperative Executive Committee (2018 – present)

Member, Mathematics Teacher Education Partnership Leadership and Planning Team (2014 – 2020).

Co-leader, APLU's Mathematics Teacher Education Partnership Active Learning in Mathematics Research Action Cluster (2014 – 2020).

Reviewer, 33 grant proposals for NSF-SEMINAL project supporting of departmental change promoting active learning in the precalculus through calculus 2 sequence.

Reviewer, six SIGCSE'18 conference proposals

NSF Panelist for Historically Black Colleges and Universities - Undergraduate Program (HBCU-UP)

Reviewer, four 2018 NCTM Research Conference proposals

Reviewer, three SIGCSE’17 conference proposals

Member, Board of Directors, US Mathematics Recovery Council. 3 year term (Aug 2013 – 2016)

Member, Mathematics Teacher Education Partnership Measurement Group (2013 – 2016).

Chair, Active Learning in Mathematics Research Action Cluster for Mathematics Teacher Education Partnership (2014 – 2016)

Guest Editor of May 2014 issue of the New England Mathematics Journal

Panel reviewer in March 2013 for National Science Foundation Historically Black Colleges and Universities Undergraduate Program (HBCU-UP)

Panel Chair in March 2011: Reviewer for National Science Foundation DRK-12 proposals for classroom assessment in mathematics.

Common Core State Standards for Mathematics, Professional Development Advisory Group (2011): *Invited to a national meeting of approximately 40 math education faculty and educators with the charge to summarize recommendations regarding professional development in mathematics education. The final report was submitted to the National Science Foundation and other constituencies to inform policy related to the implementation of the Common Core*.

Common Core State Standards Teacher Education Advisory Panel. (2010 – 2011). *Invited to participate on a panel of 10 math and science educators, to articulate recommendations submitted to the Association of Public and Land-grant Universities and the Science and Mathematics Teacher Imperative regarding the role of higher education in supporting implementation of the Common Core Standards for Schools*.

Advisory Panel for NSF REESE grant "The Development of Computational Thinking among Middle School Students Creating Computer Games" (2010 – present).

Chair for AERA 2011 Conference Symposium "The Undergraduate Learning Assistant Model: Teachers' Conceptions and Practices During Induction Years"

Panel Chair in Feb 2010: Reviewer for National Science Foundation ITEST grant proposals

Chair and Discussant for AERA 2010 Conference Session "Researching Mathematics Curriculum and Teaching: Tasks, Methods, and Results"

Discussant for AERA 2010 Conference Session "Exploring What We Know: Mathematics, Teachers' Knowledge, and Beliefs"

Common Core State Standards for Mathematics, Curriculum Developers Advisory Meeting (2010).

Member of the Review Board for Division C, Mathematics of AERA (2009-2010) – 11 proposals reviewed.

Reviewer for AERA Research in Mathematics Education SIG (2009) – 9 proposals reviewed

Reviewer for *Journal for Teacher Education, Journal for Research in Mathematics Education, American Education Research Journal, PRIMUS, Educational Policy, Mathematics Teaching in the Middle Grades, Mathematics Teacher*, *Teaching Children Mathematics* and professional conferences (e.g., PME-NA, AERA, NCTM research pre-session, Biennial Joint European Association for Research in Learning and Instruction, et al)

Co-chair, Division C, Section 2, AERA Annual Convention (1998)

Mathematics Content Review Panel for “Studies of Enacted Curriculum” project, *Cyberchase* television series, and the Annenburg professional development video series for algebra

University & State Service

Academic Review and Planning Advisory Committee (ARPAC), 2021-2023 (3-year term)

Executive Director, Freudenthal Institute USA (2003 – present)

Advisory Board Member, Project Launchpad (PI Sandra Laursen)

Fellow, CU-Boulder Center for STEM Learning (2013 – 2022)

Member, St. Vrain Valley School District Secondary Mathematics Collaborative (Fall 2019-Spring 2020)

Participant, CU Boulder Research Development Meetings (2019)

Academic Affairs Budget Advisory Committee (2019)

Computer Science Department Post Baccalaureate Advisory Committee (2019)

Participant, K-12 Cybersecurity Summit (May 2019)

Presenter/Facilitator, Mathematics Pathways, Transfer Summit Meeting at Front Range Community College (March 2019)

Participant, CU Boulder PI Academy Breakfast (March 2019)

Writing team for the Colorado State Standards for Computer Science Education (2017 – 2018).

Reviewer, six CU Boulder Chancellor's Award grant proposals (2017)

Volunteer consultant for BVSD Assessment Development for Algebra (2016 – 2018).

Lead team member of the Colorado Partnership for Secondary Mathematics Education, an institutional member of the APLU/SMTI Math Teacher Education Partnership (http://www.aplu.org/page.aspx?pid=2184).

Panelist at Silver Creek High Schools' Parent Math Night (January 20, 2016).

Chair of SOE CUTeach group: Math/Sci Secondary Education (2014 – 2016).

Assisted with professional development of graduate students in mathematics (2014-2015).

Member of the Colorado Content Collaboratives Technical Steering Committee (2012). Invited member of an advisory committee to review and critique the development and quality of assessments and related systems prepared by various Colorado Content Collaboratives.

Member of the Colorado Department of Education Math Partners Group (2009). Invited member of a group charged with developing recommendations for dissemination and implementation of the revised Colorado State Content Standards for Mathematics.

Member (2008), CU-Boulder Flagship 2030 Facilities Task Force.

Coordinator of Realistic Mathematics Education mini-conference (Nov 16) at Boulder, CO. Attended by CU-Boulder faculty and graduate students, Front Range Community College math faculty, and school administrators and teachers from PIE districts.

University of Colorado President's Teaching Scholars coach for Mary Nelson, Applied Math Department, to support her ongoing research activities in Calculus II, following the model of Carnegie Scholars (2005 – 2006).

School of Education Service

SOE Ed Minor/Ed Studies Committee, Member, 2021 – present

SOE Curriculum Committee, Member, Fall 2023– present

STEM Education Interim Chair, May – Dec, 2022

Dean's Advisory Committee, May – Dec, 2022

Reviewed grant proposals for the Colorado RISE grant competitions (Oct & Dec 2020)

Facilitate MA degree orientation session for STEM education students. (Nov 2020)

Member, SOE Hybrid/Online education committee (2020)

Interim Associate Dean for Research (2019)

Dean's Advisory Committee (2019)

Facilitator SOE Partnership Award Panel Review (May 2019)

Reviewer, 8 proposals for SOE Partnership Award (May 2019)

Member, SOE Instructional Technology Committee (2017 – 2018)

SOE Showcase for Graduate Students, C&I presenter (2016).

Search Committee for CUTeach Math and Science Master Teachers (2016).

Reappointment committee for Enrique Lopez (2016).

Reappointment committee for Jeffrey Writer (2016).

Lead for the Development of Online MA degree in Math and Science Education.

Member, CU-Boulder School of Education Technology Task Force

Member and Endorsed Reviewer for the Teacher Performance Assessment Consortium, 2011 – present

Member Dean's Advisory Committee, 2011-2012

Search Committee member for Assoc Dean of Teacher Education, 2015

Search Committee member for Elementary Science Education Candidate, 2015

Search Committee member for Mathematics Education Candidate, 2006 – 2007, 2011-12

Search Committee member for Science Education Candidate, 2010 - 2012

Search Committee member for Master Teacher for CUTeach, 2008, 2011

Search Committee member for Admin Assistant for CUTeach, 2008

Search Committee member for Assoc Dean of Research, 2007 & 2008, 2012

Auxiliary Search Committee member for Ed Psych position, 2007

Other Professional Service Activities

Presentation to Colorado Department of Education math leaders: From Principles to Action in Assessment (2015)

Member, Boulder Valley School District Secondary Math Curriculum Adoption Committee (2012)

Consultant (2007 – 2008). Albany School District #1, Laramie, WY, to support the development of mathematics teachers' classroom assessment practices in Grades K – 12.

Invited Member, Boulder Valley School District Mathematics and Science Graduation Task Force (2007)

Voluntary professional development services for Coal Creek K-8 (Jefferson County School District, Colorado) to support teachers' assessment practices and implementation of a reformed math curriculum. Regular meetings every other month in 2007.

Voluntary professional development services for Arapahoe Ridge Elementary (Adams 12 School District, Colorado) to support teachers' formative assessment practices and decision making (Special Ed Focus; 2007).

Presentation for BVSD elementary teachers to support use of online instructional interventions in K-8 mathematics (4 meetings in 2007)

Voluntary professional development services for Coal Creek K-8 (2006 – 2008) Jefferson County School District, Colorado, to support teachers' assessment practices and implementation of a reformed math curriculum. Regular meetings every other month.

Planning meetings with Denver Public Schools (Cathy Martin, Kris O'Clair, et al) and FiUS (Peter Boon & Frans van Galen) to support instructional interventions in middle grades mathematics in Denver Public Schools (3 meetings in 2007)

Planning meetings with Google/SketchUp and FiUS to support use of SketchUp and online software tools in mathematics education. (2007 – 2008)

Member (2005-2007), Ryan Elementary Strategic Planning Committee, Lafayette, CO.

Member (2005-2007), Board of Advisors, EdVantage Reports, Denver, CO

Consultant (2004-2006), The El Paso Collaborative for Academic Excellence, to support the development, field testing, scoring, analysis, and revision of algebra assessments that will be used as both a placement exam for local colleges and also as a summative exam for high school Algebra 2 courses.

Doctoral Students Advised or Currently Advising
Sarah Roberts – Ph.D. earned in Summer 2009, Assistant Professor at UC Santa Barbara
Krista Marshall – Ph.D. earned in Spring 2013, JeffCo Public Schools Assessment Analyst
Greta Frohbeiter – dissertator (in memorium: passed away Dec 2014)
Fred Peck – Ph.D. earned in Summer 2015, Assistant Professor at University of Montana
Ryan Grover – Ph.D. earned in Fall 2015, employed by MathXL
Susan Miller – Ph.D. earned in Spring 2017, MS Principal in Connecticut
Raymond Johnson – Ph.D. earned in Fall 2018, Mathematics Specialist for Colorado Department of Education
Michael Matassa – advanced standing
Jeffrey Bush – Ph.D. earned Summer 2020, Research Associate for ICS
Monica Campbell – Ph.D. earned Summer 2020, MS Math teacher Casey MS (co-advisor with Vicki Hand)
Nancy Kress – Ph.D. earned in Fall 2021, post-doctoral researcher at CU-Boulder
Rebecca Machen – Ph.D. earned in Spring 2024
Peter Karanevich – 3rd year (pass comprehensive exam Fall '23).
Andrew Angstrom – 1st year.

Academic/Research Presentations (* = peer-reviewed)

Webb, D. C. (2023, November). *Computational Thinking as a Goal for Mathematics Education: Past Challenges and Future Directions.* Invited Keynote Presentation at the Užití počítačů ve výuce matematiky (Use of Computers in Teaching Mathematics Conference). University of South Bohemia, České Budějovice, Czech Republic.

* Webb, D. C. (2023, October). *Games as a Context for Infusing Executive Function Processes with STEM Education*. Presentation at the International Society for Design and Development of Education conference. Boston, MA.

* Webb, D. C. (2022, September). *Spark Math: Lessons Learned in Co-Designing Instructional Resources for Mathematics that Support Executive Function and Student Engagement*. Presentation at the International Society for Design and Development of Education conference. Nottingham, UK.

* Kress, N. E., Machen, R., & Webb, D.C. (2022, August). *Inclusive Early Undergraduate Mathematics: Evolution through the Covid-19 Pandemic.* Presentation at the Annual MathFest conference. Philadelphia, PA.

Webb, D. C., & Gobstein, H. (2022, May). *Be Thoughtful Articulating your Vision for Change.... It Might Just Happen.* Presentation for the SEMINAL Change-DIAL Conference, Lincoln, NE.

Webb, D. C. (2021, December). *Understanding Formative Assessment: Assessing Student Understanding.* Invited Research Talk at the University of South Bohemia, České Budějovice, Czech Republic.

Webb, D. C., & Uhing, K. (2021, June). *Impacts, Lessons Learned & Planning forward.* Presentation for the SEMINAL Summer Workshop. Virtual.

Webb. D. C. (2021, May). Panelist on Successful Department Change Efforts to Transform Precalculus and Calculus (Virtual Panel Presentation for the Mathematical Association of America).

* Gobstein, H., Rasmussen, C., Smith, W. & Webb, D.C. (2019, November). *Change Efforts to Improve Student Success in Foundational Math Courses.* Presentation at the AAC&U Transforming STEM Higher Education conference. Chicago, IL.

Webb, D. C., Gomez, C. & Nelson. M. (2019, October). *Math curriculum materials*. Invited presentation at the 2019 International Learning Assistant Conference. Boulder, CO.

Perkins, K., Webb, D.C., Massey-Allard, J. & Wang, K. (2019, September). *Formative Assessment with Interactive STEM Simulations: Strategies Informed by Research*. Presentation at the NCME Special Conference on Classroom Assessment. Boulder, CO.

Webb, D.C. (2019, September). *Active Learning in the Undergraduate Calculus Sequence. What does the research say?* Presentation at the Applied Mathematics Department Teaching Excellence Seminar. Boulder, CO.

* Smith, W., Rasmussen, C., Webb, D. C., Tubbs, R., Voigt, M. & Gobstein, H. (2019, January). Student Engagement in Mathematics through an Institutional Network for Active Learning (SEMINAL). Presentation at the Joint Mathematics Meetings of the AMS/MAA. Baltimore, MD.

Webb, D. C. & Monks, K. (2018, November). *Curriculum materials for LA-supported math courses*. Invited presentation at the 2018 International Learning Assistant Conference. Boulder, CO.

Webb, D. C. (2018, July). *Aligning Assessment with Course Goals* (Project NExT Panel). Invited panel presentation at the Annual MathFest Conference. Denver, CO.

Perkins, K. K., Webb, D. C. Hensberry, K. & Whitacre, I. (2018, June). Teaching and Learning Algebraic Thinking Across the Middle Grades: A Research-based Approach Using PhET Interactive Simulations. Poster presentation at the NSF DRK-12 meeting. Washington, DC.

Webb, D. C. (2018, June). *Undergraduate Learning Assistants in Mathematics: Designing Opportunities to Recruit and Prepare Future Teachers*. Presentation at the Annual Meeting of the Mathematics Teachers Education Partnership. Denver, CO.

* Webb, D. C. (2018, May). *Design considerations with technology to support teachers' formative assessment*. Presentation at the International Society for Design and Development of Education conference. Galway, Ireland.

Webb, D. C. (2018, May). *Active Learning Design Principles: A Vision for Student Engagement and Learning in Undergraduate STEM Education*. Invited keynote presentation to the Center for Education Innovation and Learning in the Sciences (CEILS) at UCLA. Los Angeles, CA.

* Webb, D. C. (2018, April). *What is the Role of Computational Thinking in Math Education?* Discussion Session presented at the NCTM Research Conference. Washington, DC.

Webb, D. C. (2018, April). *Creating Opportunities for Active Learning in Undergraduate Calculus Courses*. Invited colloquium presentation to the California State University at Fullerton Mathematics Department. Fullerton, CA.

* Webb, D. C. (2018, January). *The Role of Low Instructional Overhead Tasks as Supports for Active Learning in Undergraduate Calculus Courses*. Presentation at the Joint Mathematics Meetings of the AMS/MAA. San Diego, CA.

* Webb, D. C., Bowers, J., Voigt, M. & Kress, N. (2018, January). Student Engagement in Mathematics through an Institutional Network for Active Learning (SEMINAL). Poster presentation at the Joint Mathematics Meetings of the AMS/MAA. San Diego, CA.

* Webb, D. C. (2017, November). *Design Context Considerations for the Use of Interactive Mathematics Simulations with Touch Screen Technologies*. Presentation at the annual meeting of the International Society for Design and Development in Education. Berkeley, CA.

* Bush, J., McGarry, A., & Webb, D. C. (2017, November). *Co-Design of Activities for PhET Simulations, Balancing Reform and Reality*. Presentation at the annual meeting of the International Society for Design and Development in Education. Berkeley, CA.

Webb, D. C. (2017, October). *Strategies for Greater Integration of Active Learning in Undergraduate Calculus Courses*. Invited colloquium presentation to the mathematics department at Western Michigan University. Kalamazoo, MI.

Webb, D. C. (2017, September). Approaches to Infusing Active Learning Design Principles in Undergraduate Calculus Courses. Invited colloquium presentation to the mathematics department at California State University Chico. Chico, CA.

Webb, D. C. (2017, June). *Effective approaches and instrumentation for ITEST research and evaluation: Computational Thinking*. Presentation at the STELAR ITEST PI & Evaluator Summit. Arlington, VA.

Webb, D. C. (2017, April). *Active Learning in Undergraduate Calculus: Design Principles for Student Engagement*. Invited colloquium presentation to the mathematics department at Auburn University. Auburn, AL.

Webb, D.C. (2016, September). *Scalable Game Design: Getting Programming Back into Schools through Games and STEM Simulations*. Invited panelist presentation at the NSF-OSTP Next Generation STEM Meeting. Washington, DC.

Webb, D.C. (2016, October). *Infusing Active Learning Design Principles in the Undergraduate Calculus Sequence*. Invited colloquium presentation to the mathematics department at the University of Hawaii-Manoa. Honolulu, HI.

Webb, D.C. (2016, May) *Computational Thinking as a Goal for Teacher and Student Learning*. Presentation at the NSF ITEST meeting. National Harbor, MD.

Webb, D.C., & Stade, E. (2016, March). *Design Principles for Infusing Active Learning in Undergraduate Calculus*. Colloquia presentation to the mathematics department at University of Montana. Bozeman, MT.

Miller, S. B., & Webb, D. C. (2015, October). *Igniting STEM Interest through Scalable Game Design*. Presentation to the Annual UCAR Members Meeting. Boulder, CO.

Webb, D. C. (2015, September). *The Challenge and Promise of RME*. Plenary Presentation at the 5th International Realistic Mathematics Education Conference. Boulder, CO.

* Lazarro, C. & Webb, D. C. (2015, July). *2015 TIMSS Advanced and Advanced Placement Alignment Study*. AP Annual Conference. Austin, TX.

Webb, D. C. (2015, January). *Progressive formalization applied: Supporting classroom assessment practices through the development of actionable mathematics knowledge for teaching*. Invited presentation at the Weizmann Institute of Science, Rehovat, Israel.

Webb, D. C. (2013, September). *Furthering the Conversation: Recognizing Tensions and Opportunities in Design Research Across the STEM Disciplines*. Plenary Session at the 4th International Realistic Mathematics Education Conference, Boulder, CO.

van der Kooij, H. & Webb, D. C. (2013, September). *Math and sciences: different subjects, but one common goal for STEM*. Joint US-NL Skype-supported presentation at the 4th International Realistic Mathematics Education Conference, Boulder, CO.

Webb, D. C. (2013, May). *Scalable Game Design: Student Design of Games and Simulations to Motivate Future Study of Math and Science*. Invited presentation at the University of Amsterdam, Netherlands.

Webb, D. C. (2013, May). *Student Research Roundtable: Methodological Issues in Mathematics Education*. Invited colloquium speaker at the University of Amsterdam, Netherlands.

* Webb, D. C. (2013, April). *Mathematics Teachers' Instructionally Embedded Assessment Practices*. Paper presentation as part of the symposium "Improving the Way Teachers Connect Assessments with Learning in Mathematics" at the Annual Meeting of the National Council on Measurement in Education, San Francisco, CA.

* Webb, D. C. (2013, April). *Integrating Classroom Assessment and Instruction*. Paper presentation as part of the symposium “Synthesizing Assessment Research from the International Congress of Mathematics Education” at the NCTM Research Pre-Session Conference, Denver, CO.

Webb, D. C. (2012, July). NCTM Reforms: Past Trials and Current Problems. Invited Lecture at the Graduate School of Education, University of Fukui, Japan.

Webb, D. C. (2012, July). RME: A Theory for Curriculum Development and Classroom Practice. Invited Lecture at the University Seminar on Mathematics Education, Japan.

* Webb, D. C. (2012, April). *Implementing the vision: Supporting change in teachers’ classroom assessment practices.* Proposal for a paper presentation as part of the symposium “Assessment Standards for Mathematics: Where are we 17 years later?” at the NCTM Research Pre-Session Conference, Philadelphia, PA.

* Webb, D. C. (2011, April). *Integrating Assessment Principles and Disciplinary Content in Professional Development: Supporting Teacher Change in Classroom Assessment*. Paper presented at the Annual Meeting of the American Educational Research Association, New Orleans, LA.

* Webb, D. C., & MacGillivary, H. (2011, April). *Teachers' Conceptions of Computational Thinking: The impact of iDREAMS on teachers’ articulation of CT and related*

reasoning. Paper presented at the Annual Meeting of the American Educational Research Association, New Orleans, LA.

* Barr S., & Webb, D. C. (2011, April). *Relating Classroom Artifacts to the Nature of Classroom Practice Using the Scoop Notebook*. Paper presented at the Annual Meeting of the American Educational Research Association, New Orleans, LA.

* Gray, K. E., Webb, D. C., & Otero, V. K. (2010). *Are Learning Assistants Better K-12 Science Teachers?* PERC Proceedings 2010, Melville, NY: AIP Press.

* Webb, D.C. (2010, May). *Collective Simulations as a Context for Student Scientific Inquiry: Effects on Student Attitudes and Beliefs toward Science*. Paper presented at the Annual Meeting of the American Educational Research Association, Denver, Colorado.

* Repenning, A., Ioannidou, A., Webb, D., Keyser, D., MacGillivary, H., Marshall, K. S., & Pohawpatchoko, C. (2010, May). *Teaching Computational Thinking through the Scalable Game Design Curriculum*. Paper presented at the Annual Meeting of the American Educational Research Association, Denver, Colorado.

* Otero, V. K., Finkelstein, N. D., Talbot, R. M., Webb, D. C., Moin, L. J., Klymkowski, M. W., & Krajik, J. (2009, April). *Symposium: A Longitudinal Study on Pedagogical Content Knowledge: Synthesizing our Research on Content, Pedagogy, and Practice*. Presentation at the Annual Meeting of the National Association for Research in Science Teaching, Garden Grove, CA.

* Ioannidou, A., Repenning, A., & Webb, D. C. (2008, September). *Using Scalable Game Design to Promote 3D Fluency: Assessing the AgentCubes Incremental 3D End-User Development Framework*. Paper presented at the IEEE Symposium on Visual Languages and Human-Centric Computing, Herrsching am Ammersee, Germany.

* Webb, D. C. (2008, August). *Progressive Formalization as an Interpretive Lens for Increasing the Learning Potentials*. Poster presented at the Biennial Joint European Association for Research in Learning and Instruction/Northumbria SIG Assessment Conference, Potsdam, Germany.

Webb, D. C. (2008, July). *Design Considerations: Supporting Teacher Design of Classroom Assessment*. Presentation at the International Society for Design and Development in Education Conference. Egmond aan Zee, Netherlands.

* Webb, D. C. (2008, April) *Effectiveness of Mathematics Curricula and Programs* (Discussant). Presentation at the Annual Meeting of the American Educational Research Association, New York, NY.

* Webb, D. C., van der Kooij, H., & Geist, M. (2008, January). *Application of Dutch Curriculum Design Principles in College Algebra: Meaningful Contexts that Promote Mathematical Insight.* Paper presented at the Joint Mathematics Meetings (Mathematical Association of America & American Mathematical Association), San Diego, CA.

* Geist, M. R., Webb, D. C., & van der Kooij, H. (2008, January). *The impact of curriculum change on teacher practice: The case of College Algebra*. Paper presented at the annual Joint Mathematics Meetings (Mathematical Association of America & American Mathematical Association), San Diego, CA.

* Webb, D. C. (2007, August). *Assessment as a Means to Improve Potentials of Student Learning*. Paper presented at the Annual Meeting of the European Association for Research in Learning and Instruction, Budapest, Hungary.

* Webb, D. C. (2005, April). *The impact of a standards-based curriculum, Mathematics in Context: The final results.* Presentation for the Research Pre-session of the National Council for Teachers of Mathematics, Anaheim, CA.

* Rubinstein, D., & Webb, D. C. (2005, April). *Creating a district assessment plan that supports growth in teachers' classroom assessment practices.* Presentation for the Annual Meeting of the National Council for Supervisors of Mathematics, Anaheim, CA.

* Webb, D. C. (2004, July). *Classroom assessment as a research context: Variations on a theme of pedagogical decision making*. Invited paper presented at the International Congress on Mathematics Education, Copenhagen, Denmark.

* Webb, D. C. (2000, June). *Using a multi-dimensional assessment system to evaluate the impact of a Standards-based mathematics curriculum on student achievement.* Paper presented at the Council of Chief State School Officers 30th Annual National Conference on Large-Scale Assessment, Snowbird, UT.

* Webb, D. C. (2000, April). *Variations in teachers' classroom assessment practices*. Paper presented at the Annual Meeting of the American Educational Research Association, New Orleans, LA.

* Webb, D. C. (2000, April). *Enriching opportunities for assessment through classroom discourse*. Paper presented at the Annual Meeting of the American Educational Research Association, New Orleans, LA.

* Webb, D. C., Greenlaw-Meyer, M., Her, T. (2000, April). *Toward classroom assessment strategies that promote student understanding*. Interactive poster session presented at the Annual Meeting of the American Educational Research Association, New Orleans, LA.

* Wortham, D. W., Webb, D. C., & Atkinson, R. K. (1997, April). *Effects of two instructional treatments on student solutions to missing-value proportion problems.* Paper presented at the annual conference of the American Educational Research Association, Chicago, IL.

Practitioner Oriented Presentations and Workshops (* = peer-reviewed)

Webb, D. C. (2023, December). *Demonstration Lesson for Rational Number using Spark Math.* Demonstration lesson for middle school math teachers at Paterson School 8. Paterson, NJ.

Webb, D. C. (2023, December). *Demonstration Lesson for Algebraic Reasoning using Spark Math*. Demonstration lesson for middle school math teachers at Paterson School 12. Paterson, NJ.

Webb, D. C. (2023, October). Integrating Math and Executive Function Processes in a Rational Number Game. Invited Workshop for elementary teachers at the University of South Bohemia, České Budějovice, Czech Republic.

Webb, D. C. (2023, October). *Assessing Student Understanding of Mathematics Using Principles for Task Design and Formative Assessment*. Virtual workshop planned and facilitated for

eight secondary mathematics teachers and school administrators at the Seoul International School. Seoul, South Korea.

Co facilitator of 3 day workshop June 2023. Supporting Students in Making Sense of the World Using Mathematics (for nine local mathematics teachers to build a network of mentor teachers). Boulder, CO.

Webb, D. C., & Davidson, J. (2023, June). *Demonstration Lessons for Ratio and Rates Spark Math Unit*. Workshop for 8 middle school math teachers and school administrators for SparkMath. Paterson School District, Paterson, NJ.

* Johnson, R., Peck, F.A., & Webb, D. C. (2022, September). *Making Meaning of Systems of Equations with Contexts and Representations.* Presentation at the Annual Meeting of the National Council of Teachers of Mathematics. Los Angeles, CA.

Webb, D. C., & Gantt, D. P. (2022, September). *Making Sense of Ratios***.** Workshop for 10 secondary math teachers and school administrators for SparkMath. Middletown City Schools, Middletown, OH.

Webb, D. C., & Gantt, D. P. (2022, August). *The Role of Executive Function in Learning***.** Workshop for 14 secondary math teachers and school administrators for SparkMath. Meridian Public School District, Meridian, MS.

Webb, D. C. (2021, December). Understanding Formative Assessment: Assessing Student Understanding. Invited Workshop at the Gymnázium Jiřího Ortena, Kutná Hora, Czech Republic.

Webb, D. C. (2021, December). Demonstration of Active Learning in Undergraduate Calculus. Invited Workshop at the University of South Bohemia, České Budějovice, Czech Republic.

Moore-Russo, D. & Webb, D.C. (2020, June). Assessing Student Knowledge. Presentation at the SEMINAL Virtual Summer 2020 Workshop.

Webb, D.C. (2019, June). *Realistic Mathematics Education: Supporting Student Ownership and Engagement by Making Mathematics and Science Sensible.* Invited presentation for the Third Annual Ambitious Math and Science Summer Institute. Corvallis, OR.

Webb, D.C. (2019, June). *Designing a More Realistic Mathematics Education: Rethinking Task Design and Instructional Sequences from an RME Perspective.* Invited presentation for the Third Annual Ambitious Math and Science Summer Institute. Corvallis, OR.

Webb, D.C. (2019, June). *Using Context and Representation to Support Student Understanding: Using PhET Math Sims***.** Workshop for 18 secondary math teachers for PhET. Boulder, CO.

Gluck, F. & Webb, D.C. (2019, June). *STEM Modeling is as Easy and Fun as Game Design.* Workshop presentation at the Rocky Mountain Computer Science Conference for P-12. Thornton, CO.

* Webb, D. C, Johnson, R., & Peck, F.A. (2019, April). *Making logarithms meaningful through progressive formalization.* Presentation at the Annual Meeting of the National Council of Teachers of Mathematics. San Diego, CA.

* Webb, D. C. (2019, April). *Using Dynamic Mathematics Simulations to Disrupt and Promote Classroom Discourse*. Presentation at the Annual Meeting of the National Council of Supervisors of Mathematics, San Diego, CA.

Eade, F. & Webb, D. C. (2018, September). *Moving from disowning to owning Realistic Mathematics Education*. Presentation at the Sixth International Realistic Mathematics Education Conference. Grand Cayman, Cayman Islands.

Webb, D.C. (2018, August). *The Role of Context and Representation in Supporting Student Understanding: Using PhET Math Sims*. Workshop for 32 secondary math coaches for Digital Promise/Verizon. Boulder, CO.

Webb, D.C., Kress. N., Campbell, M., & Bush, J. (2017, June). *Math Integration into Computer Programming*. Three-hour workshop for K-12 teachers at the Scalable Game Design Summer Institute. Boulder, CO.

* Johnson, R., Peck, F. & Webb, D. C. (2018, April). *Building meaning into algebra equations using multiple representations and progressive formalization.* Presentation at the Annual Meeting of the National Council of Teachers of Mathematics. Washington, DC.

Webb, D.C. (2017, June). *Using representational pathways to support student sense making and reasoning in mathematics.* Invited presentation for the Colorado Northwest BOCES. Steamboat Springs, CO.

Webb, D.C., Campbell, M., Brand, C., & Kress. N. (2017, June). *Common Core Math and Integrating Math into Computer Programming*. Presentation at the Scalable Game Design Summer Institute. Boulder, CO.

Miller, S., Bush, J., Webb, D. C., & Campbell, M. (2017, June). *Computational Thinking Unplugged*. Presentation at the Scalable Game Design Summer Institute. Boulder, CO.

Webb, D.C., Kress. N., Campbell, M., & Bush, J. (2017, June). *Math Integration into Computer Programming*. Three-hour workshop at the Scalable Game Design Summer Institute. Boulder, CO.

* Webb, D. C., & Miller, S. B. (2017, April). *Principles for Technology Integration and Adaptation that Promote Student Engagement and Learning*. Presentation at the Annual Meeting of the National Council of Supervisors of Mathematics, San Antonio, TX.

Webb, D. C. (2017, April). *Scalable Game Design: Getting Programming Back into Schools through Games and STEM Simulations*. Presentation to STEM teachers and administrators at the Alabama Math, Science, and Technology Initiative Center. Opelika, AL.

Webb, D. C. (2016, September). Facilitation of formative assessment workshop for CU-Boulder School of Education student teachers. Boulder, CO.

Miller, S., Bush, J., & Webb, D.C. (2016, September). *Active Learning? Let Me Count the Ways!* Invited Workshop for Presidential Award STEM Teachers for the White House Office of Science and Technology Policy. Washington, DC.

Webb, D. C. (2016, August). Two-day classroom assessment workshop for Greeley-Evans School District 6 secondary math teachers. Greeley, CO.

Webb, D. C. (2016, March). *Integrating Design Principles for Active Learning in Post-Secondary Mathematics*. Invited keynote presentation at the Colorado American Math Association of Two-Year Colleges Annual Meeting. Pueblo, Colorado.

Stade, E., & Webb, D.C. (2016, March). *Active Learning Calculus Workshop for Mathematics Education group*. University of Montana. Bozeman, MT.

Hodge, A., Stade, E., & Webb, D.C. (2015, June). *Inquiry-Based Learning, Mathematics Teacher Education Partnership, Fundamental Theorem of Calculus, and Me*. Invited Keynote Presentation to the 18th Annual Legacy of R. L. Moore and IBL Conference. Austin, TX

Webb, D. C. (2015, April). *Assessing Student Understanding of Mathematics Using Principles for Task Design and Formative Assessment*. Invited keynote presentation for the CSU-Pueblo Noyce Scholars Seminar. Pueblo, CO.

* Webb, D. C. (2015, April). *Wicked Cool Algebra Tools: Making Sense of Patterns and Functions*. Presentation at the Annual Meeting of the National Council of Teachers of Mathematics, Boston, CO.

Webb, D. C. (2015, January). *Design and use of formative assessment that informs instruction*. Invited workshop at the Weizmann Institute of Science, Rehovat, Israel.

Webb, D. C. (2014, October). *Teaching & Learning Secondary Mathematics: Developing a Coherent Approach*. Presentation to Greeley-Evans School District 6 secondary math teachers. Greeley, CO.

Webb, D. C. (2014, August). *Using Formative Assessment to Support Meaningful & Practical Math in CTE*. Workshop for Greeley-Evans School District 6 Career and Technical Education MS/HS Teachers. Greeley, CO.

Webb, D. C. (2014, August). *CTE as a Context for Mathematics: Opportunities for Engagement & Understanding*. Invited presentation for the meeting of Greeley-Evans School District 6 Career and Technical Education MS/HS Teachers. Greeley, CO.

* Repenning, A., & Webb, D. C. (2014, July). *Computational Thinking: From Game Design to STEM in One Week*. Presentation at the Annual Meeting of Computer Science Teachers Association, St. Charles, IL.

* Webb, D. C. (2014, April). *Algebra on My Mind: Tools to Promote Algebraic Reasoning.* Presentation at the Annual Meeting of the National Council of Teachers of Mathematics, New Orleans, LA.

Webb, D. C. (2014, February). *Understanding Student Learning to Assess Student Understanding*. Invited presentation at the Educational Service Unit #13 SOAR's Mid-Winter Conference, Scottsbluff, NE.

Webb, D. C. (2014, February). *Teacher Design of Formative Assessment: Keeping it Meaningful & Practical*. Invited presentation at the Educational Service Unit #13 SOAR's Mid-Winter Conference, Scottsbluff, NE.

Webb, D. C. (2013, May). *Deepening the Knowledge: Strategic Design and Use of Numeracy Tasks to Develop Students' Algebraic Reasoning*. Invited half-day presentation for the National Math Recovery Conference, Denver, CO.

Webb, D.C. (2013, May). *Knowing Where You Want Students to Go, but Not Sure How To Get There? Making Assessment more Informative to Support Instruction*. Invited Keynote Presentation for the National Math Recovery Conference, Denver, CO.

* Webb, D. C. (2013, April). *Understanding Student Learning to Assess Student Understanding*. Presentation at the Annual Meeting of the National Council of Supervisors of Mathematics, Denver, CO.

* Webb, D. C. (2013, April). *Promoting Student Reasoning and Understanding Using Representational Pathways*. Presentation at the Annual Meeting of the National Council of Teachers of Mathematics, Denver, CO.

Webb, D.C. (2012, October). *Bringing Mathematics Teaching and Learning Full Circle Using Formative Assessment*. Invited Keynote Presentation for the 31st Annual Conference on the Improvement of Mathematics, Hammond, IN.

Webb, D.C. (2012, October). *Promoting Algebraic Reasoning and Mathematical Structure through Representations*. High School Workshop for the 31st Annual Conference on the Improvement of Mathematics, Hammond, IN.

Webb, D. C. (2011, September). *Informed Classroom Practice: Progress and Challenges*. Presentation at the 3rd Realistic Math Education Conference, Boulder, CO.

Webb, D. C. (2011, February). Using Representational Pathways to Increase Student Access to and Understanding of Mathematics. Invited Keynote Presentation for the Kentucky Center for Mathematics, Lexington, KY.

Webb, D. C. (2011, January). *Using Student Responses to Inform Design and Revision of Classroom Assessment.* Design and facilitation of a full-day workshop for high school mathematics teachers, Middletown School District, Middletown, OH.

Webb, D. C. (2010, October). *Development of Balanced Summative Assessments in Algebra and Geometry.* Design and facilitation of a full-day workshop for high school mathematics teachers, Middletown School District, Middletown, OH.

Webb, D. C. (2010, September). *Design and Practice of Classroom Assessment in Secondary Mathematics Classrooms.* Design and facilitation of a full-day workshop for high school mathematics teachers, Middletown School District, Middletown, OH.

* Webb, D. C. (2010, October). *Accessible Assessment: Selecting and Designing Tasks That Show What Students Know*. Presentation for the National Council for Teachers of Mathematics, Regional Conference, Denver, CO.

Webb, D. C. (2010, August). *Understanding Formative Assessment: Assessing Student Understanding in Math and Science.* Invited Keynote Presentation for 100+ math and science faculty, teachers and teacher educators. Illinois Math Science Partnership, Peoria, IL.

* Webb, D. C. (2010, April). *Professional Development Experiences That Support Informed Assessment Design and Improved Formative Assessment Practices*. Presentation for the Annual Meeting of the National Council for Supervisors of Mathematics, San Diego, CA.

* Webb, D. C. (2010, April). *Under the Tip of the Iceberg: A Model for Assessment and Instruction*. Presentation for the Annual Meeting of the National Council for Teachers of Mathematics, San Diego, CA.

Webb, D. C. (2010, February). *Planning for Principled Formative Assessment Practices*. Design and facilitation of full-day workshop for 30 middle grades mathematics and special education teachers, Middletown School District, Middletown, OH.

Webb, D. C. (2010, January). *Using Student Responses to Inform the Design and Revision of Accessible Assessment*. Design and facilitation of full-day workshop for 30 middle grades mathematics and special education teachers, Middletown School District, Middletown, OH.

Webb, D. C. (2009, December). *Progressive formalization as a Framework for the Selection, Design and Interpretation of Assessment Tasks*. Design and facilitation of second full-day workshop for 30 middle grades mathematics and special education teachers, Middletown School District, Middletown, OH.

Webb, D. C. (2009, November). *Rethinking and Redesigning Classroom Assessment*. Series of workshop presentations for the Knowles Foundation Teaching Scholars Meeting, Denver, CO.

Webb, D. C. (2009, October). *Realistic Mathematics Education as Developmental Research: How theory informs practice and how practice informs theory*. Presentation at the 2nd Realistic Math Education Conference, Boulder, CO.

Webb, D.C., Uittenbogaard, W., Abels, M., & van der Kooij, H. (2009, October). *The Promise of Progressive Formalization: Supporting Student Learning Using Portraits of Mathematical Development*. Invited 2.5 hour Pre-Session for the Colorado Council of Teachers of Mathematics Conference, Denver, CO.

Webb, D. C. (2009, October). *Developing Principled Classroom Assessment Practices*. Design and facilitation of full-day workshop for 30 middle grades mathematics and special education teachers, Middletown School District, Middletown, OH.

* Webb, D. C., Larson, P., & Matassa, M. (2009, April). *The Development of Teacher Expertise in Classroom Assessment as a Context for Deeper Understanding of Mathematics*. Presentation for the Annual Meeting of the National Council for Supervisors of Mathematics, Washington, DC.

Webb, D. C. (2007, April). Beneath the Tip of the Iceberg: Representational Pathways to Increase Student Access to Mathematics. Invited Keynote for the 2nd Annual National Mathematics Recovery Conference, Westminister, CO.

Webb, D. C. (2006, April). *The Use of Models in Realistic Mathematics Education to Develop Children's Number Sense*. Invited Presentation for the National Mathematics Recovery Conference, Westminister, CO.

* Webb, D. C. (2006, September). *Using Models to Develop Children's Number Sense*. Presentation for the Colorado Council of Teachers of Mathematics Conference, Denver, CO.

* Webb, D. C. (2006, October 20). *Tools for Teachers: Success for Students*. Presentation for the Northwest Mathematics Conference, Victoria, BC, Canada.

Webb, D. C. (2006, October 24). *Using pre-formal mathematics to support students with special needs*. Invited Presentation for the Colorado Metro Math Intervention Team, Boulder, CO.

Webb, D. C. (2005, November). *Assessing realistic mathematics education*. Presentation for the Realistic Mathematics Education Conference, Madison, WI.

* Webb, D. C. (2005, April). *Tools to promote algebraic reasoning and relational thinking*. Presentation for the Annual Meeting of the National Council for Teachers of Mathematics, Anaheim, CA.

Webb, D. C. (2004, August). *What we've learned about student learning*. Invited keynote address for the Washington State Regional Conference for MiC, North Thurston, WA.

* Webb, D. C. (2004, April). *Understanding classroom assessment: Assessing student understanding.* Presentation for the Annual Meeting of the National Council for Teachers of Mathematics, Philadelphia, PA.

* Webb, D. C., Rubinstein, D., Shinners, G. (2004, April). *Supporting teacher change in classroom assessment*. Presentation for the Annual Meeting of the National Council for Supervisors of Mathematics, Philadelphia, PA.

* Webb, D. C. (2003, April). *Beyond reproduction: Assessing students' understanding*. Presentation at the Annual Meeting of the National Council for Teachers of Mathematics, San Antonio, TX.

Webb, D. C. (2002, May). *The state of mathematics: An international perspective*. Invited plenary for the South Milwaukee Conference on Mathematics, Alverno College, Milwaukee, WI.

* Meyer, M. R., & Webb, D. C. (2002, April). *Beyond belief: Rethinking classroom assessment practices*. Presentation at the Annual Meeting of the National Council for Teachers of Mathematics, Las Vegas, NV.

Webb, D. C. (2001, August). *Classroom assessment strategies to help all students master rigorous mathematics*. Co-presenter for a four-day workshop for District of Columbia Public School mathematics teachers, American Association for the Advancement of Science, Washington, DC.

Research Instruments

Webb, D.C., Miller, S.B., Nickerson, H., Grover, R., & Gutiérrez, K. (2014). *Student Centered Observation Protocol for computer-science Education* (SCOPE). Boulder, CO: University of Colorado Boulder.

Technical Reports and Working Papers

Lazzaro, C. C., Loveless, T., Sireci, S., & Webb, D. C. (2021). Advanced Placement® Calculus and Physics and TIMSS Advanced 2015: Performance Report. *College Board*.

Daro, P., Hughes, G.B., Stancavage, F., Shepard, L.A., Webb, D.C., Kitmitto, S. & Tucker-Bradway, N. (in process). *A Comparison of the 2017 NAEP Mathematics Assessment with Current-Generation State Assessments in Mathematics: Expert Judgment Study*. Commissioned by the NAEP Validity Studies Panel. Washington, DC: American Institutes for Research

Bush, J., Webb, D. C., Wyberg, T., Milne, B. (2017). Field Trial and Evaluation of Software-Based Formative Assessments for Rational Number: Research Summary. Boulder, CO: University of Colorado Boulder.

Lazzaro, C. C., Jones, L., Webb, D.C., Grover, R., Di Giacomo, F.T., & Marino, K.A. (2016). *A Framework Analysis: TIMSS Advanced 2015 and Advanced Placement Calculus & Physics*. New York: College Board.

Milne, R. B., Kelly, S. A., Webb, D. C. (2014). Effect of Adaptivity on Learning Outcomes in an Online Intervention for Rational Number Tutoring,"Woot Math," for Grades 3-6: A Multi-Site Randomized Controlled Trial. Boulder, CO.

Bush, B., Peters, S., Ronau, B., Stade, E., & Webb, D. C. (2013). Improving Mathematics Content Preparation of Secondary Mathematics Teacher Candidates (White Paper). Washington, DC: SMTI/APLU. http://www.aplu.org/document.doc?id=4522

Webb, D.C. & MacGillivary, H. (2011). iDREAMS Evaluation Report on Student Attitudes and Dispositions Towards Computer Education and Future Pursuits. [Year 2 Evaluation Report for iDREAMS, NSF # 0833612]. Boulder, CO.

Webb, D. C., & Marshall, K. S. (2011). Design and Programming in a Three-Dimensional Agent-Based Environment: Evaluation Report for the Phase II Field Test of AgentCubes [Final Evaluation Report AgentCubes Phase II, NSF # 0848962]. Boulder, CO.

Grover, R., Harris, L., Byrne, A., & Webb, D. C. (2011). Impact of LAs and Conceptual Worksheets on Students' Perception of Mathematics: I-Cubed 2010-11 End of School Year Report. Boulder, CO.

Webb, D. C., & Marshall, K. S. (2010). Web-Based Software to Support Collaborative Design Processes: Evaluation Report for the Fall 2010 pilot study of CyberCollage [Final Evaluation Report for pilot study of CyberCollage, NSF # 1014249]. Boulder, CO.

Webb, D. C., & Keyser, D. (2009). A Comparative Analysis of Student Learning with a Collaborative Computer Simulation of the Cardiopulmonary System [Final Evaluation Report for comparative research study of Mr. Vetro implementation, NIH # 5R44RR022008-03]. Boulder, CO.

Webb, D.C. (2007). FITness through AgentCubes: Game design as a problem context to improve middle school students' fluency with information technology [Evaluation Report for the Fall 2007 pilot study of AgentCubes]. Boulder, CO.

Romberg, T.A., Webb, D. C., Folgert, L., Shafer, M. C. (2005). Measures of student performance (Monograph #4, MiC Longitudinal Cross-Sectional Study). Madison, WI: University of Wisconsin-Madison.

Romberg, T.A., Webb, D. C., Folgert, L., Shafer, M. C. (2005). The Impact of MiC on Student Achievement (Monograph #5, MiC Longitudinal Cross-Sectional Study). Madison, WI: University of Wisconsin-Madison.

Romberg, T.A., Webb, D. C., Folgert, L., Shafer, M. C. (2005). Differences in Performance Between Mathematics in Context and Conventional Students (Monograph #6, MiC Longitudinal Cross-Sectional Study). Madison, WI: University of Wisconsin-Madison.

Shafer, M. C., Marten, B., Webb, D., Folgert, L., & Davis, J. (2003) *Instruction for 1997-1998* (Working Paper #30, MiC Longitudinal Cross-Sectional Study). Madison, WI: University of Wisconsin–Madison.

Shafer, M. C., Folgert, L., Webb, D., Kwako, J., Lee, C., & Wagner, L. (2003) *School Capacity for 1999-2000* (Technical Report #29, MiC Longitudinal Cross-Sectional Study). Madison, WI: University of Wisconsin–Madison.

Webb, D. C., & Meyer, M. R. (2002). *Summary report of achievement data for Mathematics in Context: A Connected Curriculum for Grades 5–8*. Madison, WI: Wisconsin Center for Education Research.

Burrill, J., Feijs, E., Meyer, M., van Reeuwijk, M., Webb, D., & Wijers, M. (2001). *The role of assessment in Standards-Based Middle School Mathematics Curriculum Materials.* St. Louis, MO: Show-Me Center.

Webb, D. C., Ford, M. J., Burrill, J., Romberg, T. A., Reif, J., & Kwako, J. (2001) *Verona Middle School Design Collaborative: Year 3 Student Achievement Technical Report*. Madison, WI: National Center for Improving Student Learning and Achievement in Mathematics and Science.

Webb, D. C., Burrill, J., Romberg, T. A., Ford, M. J., Kwako, J., & Reif, J. (2001). *Verona Middle School Design Collaborative: Year 2 Student Achievement Data Technical Report*. Madison, WI: National Center for Improving Student Learning & Achievement in Mathematics & Science, Wisconsin Center for Education Research.

Webb, D. C., Romberg, T. A., & Shafer, M. C. (2001). *Year 1 student performance on an assessment using NAEP and TIMSS items for program evaluation* (Working Paper #16, MiC Longitudinal Cross-Sectional Study). Madison, WI: University of Wisconsin–Madison.

Webb, D. C. (1998). Curriculum Correlation Summary: *New York City Board of Education Scope and Sequence* v. *Mathematics in Context*. Chicago, IL: Encyclopaedia Britannica Educational Corporation.

Webb, D. C. (1998). Correlation analysis: *State of Delaware Mathematics Performance Indicators* v. *Mathematics in Context*. Chicago, IL: Encyclopaedia Britannica Educational Corporation.

Webb, D. C. (1997). Curriculum-Assessment Correlation: *Stanford 9 Achievement Test v. Mathematics in Context*. Chicago, IL: Encyclopaedia Britannica Educational Corporation.