

CURRICULUM VITA

Janet Carlson
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I. EDUCATIONAL HISTORY

Ph.D.	University of Colorado Instruction and Curriculum in the Content Area: Science Education Dissertation: The relationship between teachers' beliefs and the use of reform-oriented science curriculum	1999
M.S.	Kansas State University Curriculum and Instruction	1986
B.A.	Carleton College Environmental Biology	1982

II. PROFESSIONAL HISTORY

2013-present Associate Professor (research) and Faculty Director, Center to Support Excellence in Teaching, Graduate School of Education, Stanford University, CA

Work with faculty, staff, and school personnel to be a significant resource for defining excellence in teaching from both a research and practice perspective. Key responsibilities include developing relationships with faculty around campus, launching a coherent research program, mentoring staff, overseeing the budget, developing programs, and working with current and potential donors.

2007 – 2013 Executive Director, BSCS, Colorado Springs, CO

Used a strategic planning process to move the organization from a focus on development projects to an approach to work driven by three lines of research; broadened and deepened the mission of the organization to focus on transforming the teaching and learning of science; and strengthened the Board of Directors by working with the Chair to recruit directors with a strong presence in the natural sciences, formal and informal science education, fund raising, and educational research.

2001 - 2007 Associate Director and Chief Science Education Officer, BSCS

Launched the Research & Evaluation Center, led major projects, supervised and mentored science educators, filled in for executive director, organized and led proposal development process.

**1999 - 2001 Assistant Professor of Education, Mercer University, Macon, GA
Chair, Macon Teacher Education Program**

Taught elementary, middle, and secondary science methods courses for undergraduate and graduate students as well as graduate courses in curriculum and science education. As chair was responsible for putting semester schedule together, organizing accreditation visit, building relationships with other colleges to increase enrollment in teacher education, and developing partnerships with schools.

1995 - 1999	Graduate Assistant, University of Colorado
1993 - 1995	Assistant Director, BSCS
1990 - 1993	Senior Staff Associate, BSCS
1986 - 1990	Staff Associate, BSCS
1985 - 1986	Graduate Assistant, Kansas State University
1982 - 1985	Middle and High School Science Teacher, Minnesota and New Hampshire

III. SCHOLARLY PUBLICATIONS AND ACTIVITY

Note: Publications (publications between 1987-2008 are under the last name of Powell)

*indicates a peer-reviewed publication

- Kavanagh, S.S., Hauser, M., Metz, M., Fogo, B., Taylor, M. & **Carlson, J.** (accepted, 2019). Practicing responsiveness: Using approximations of teaching to build instructional judgment. Manuscript in review at the *Journal of Teacher Education*.*
- Carlson, J.** & Daehler, K. (2019). Chapter 2: The Refined Consensus Model of PCK in science education and research in Hume, A., Cooper, R. & Borowski, A. (eds). *Repositioning Pedagogical Content Knowledge in Teachers' Professional Knowledge*. Sydney, Australia: Springer.*
- Daehler, K., **Carlson, J.**, Friedrichsen, P., & Kirshner, S. (in press). Chapter 3: Vignettes for Bringing the Refined Consensus Model of PCK to Life in Hume, A., Cooper, R. & Borowski, A. (eds). *Repositioning Pedagogical Content Knowledge in Teachers' Professional Knowledge*. Sydney, Australia: Springer.*
- Carlson, J.** (2018, June 4). How San Francisco is transforming science education [Blog post]. Retrieved from https://blogs.edweek.org/edweek/urban_education_reform/2018/06/transforming_science_education_in_san_francisco.html
- Bopardikar, A., **Carlson, J.**, Kimber, E. Loper, S., Roblin, N.P., & Rostovtseva, T. (2018). Three Design Heuristics for Enhancing the Use of Video to Improve Teaching Practice. *Educational Designer* 3(10) <http://educationaldesigner.org/ed/volume3/issue10/article38/index.htm>*
- Bien, A., **Carlson, J.**, Kazemi, E. Reisman, A., Scheve, M., & Wells, A. (2018). Chapter 7: Taking core practices to the field in Grossman, P. (ed.) *Teaching Core Practice in Teacher Education*. Cambridge, MA: Harvard Education Press.
- Borko, H., **Carlson, J.**, Mangram, C., Anderson, R., Fong, A., Million, S., Mozenter, S., Villa, A.M. (2017). The role of video-based discussion in a model for preparing professional development leaders. *International Journal of STEM Education*, 4:29. doi 10.1186/s40594-017-0090-3*
- Davis, E.A., Kloser, M., Wells, A., Windschitl, M., **Carlson, J.**, & Marino, J-C. (2017). Teaching the practice of leading sense-making discussions in science: Science teacher educators using rehearsals, *Journal of Science Teacher Education*. [published online <http://www.tandfonline.com/doi/full/10.1080/1046560X.2017.1302729>]*
- Gess-Newsome, J, Taylor, J. A., **Carlson, J.**, Gardner, A., Wilson, C., & Stuhlsatz, M.A.M. (2017). Teacher pedagogical content knowledge, practice, and student achievement. *International Journal of Science Education*. [published online <http://dx.doi.org/10.1080/09500693.2016.1265158>]*
- Taylor, J. A., Kowalski, S., Getty, S., Wilson, C., **Carlson, J.**, and Van Scotter, P. (2015). An efficacy trial of research-based curriculum materials with curriculum-based professional development. *American Education Research Journal* 52(5) pp. 984-1017.*
- Carlson, J.**, Stokes, L., Helms, J., Gess-Newsome, J., Gardner, A. (2015). The PCK Summit: A process and structure for challenging current ideas, provoking future work, and considering new directions. In A. Berry, P. Friedrichsen, & Loughran, J. (eds.) *Re-examining pedagogical content knowledge in science education*. New York: Routledge.
- Sickel, A.J., Banilower, E.R., **Carlson, J.**, & Van Driel, J.H. (2015). Examining PCK research in the context of current policy initiatives. In A. Berry, P. Friedrichsen, & Loughran, J. (eds.) *Re-examining pedagogical content knowledge in science education*. New York: Routledge.
- Carlson, J.** (2015). BSCS 5E instructional model and learning cycle. In Gunstone, R. (Ed.) *Springer encyclopaedia of science education*. Springer Publishing.
- Landes, N. & **Carlson, J.** (2014). *BSCS Science Tracks: Connecting science & literacy*. In Sneider, C. (ed.),

- Engineering Curricula to Go!* Thousand Oaks, CA: Corwin Press.
- Carlson, J.**, Davis, E., & Buxton, C. (2014). NARST position statement on the NGSS and curriculum materials. [invited]
- Taylor, J. Kowalski, S., Wilson, C., Getty, S., **Carlson, J.**, & Van Scotter, P. (2013). Conducting Causal Effects Studies in Science Education: Considering Methodological Trade-offs in the Context of Policies Affecting Research in Schools. *Journal of Research in Science Teaching*, 50 (9) 1127–1141. [Received 2014 JRST Award]*
- Taylor, J. A. & **Carlson, J.** (2012). Rethinking the continuing education of science teachers: An example of transformative, curriculum-based professional development. In R. E. Yager (Ed.) *Exemplary science: Best practices in professional development*, 2nd edition. Arlington, VA: NSTA Press.
- Wilson, C. D., Taylor, J. A., Kowalski, S. M., & **Carlson, J.** (2010). The relative effects and equity of inquiry-based and commonplace science teaching on students' knowledge, reasoning and argumentation. *Journal of Research in Science Teaching*, 47(3), 276–301.*
- Carlson, J.** (2009). The relationship between teaching and learning. In *The Biology Teacher's Handbook* (4th ed., pp. 3-14). Arlington, VA: NSTA Press.
- Carlson, J.**, Landes, N. M., & Gardner, A. L. (2009). How to help students construct their understanding of science concepts. In *The Biology Teacher's Handbook* (4th ed., pp. 231-248). Arlington, VA: NSTA Press.
- Carlson, J.** & Bybee, R. (2009). A BSCS perspective on contemporary biology education. In *The Biology Teacher's Handbook* (4th ed., pp. 301-312). Arlington, VA: NSTA Press.
- Carlson, J.**, Waterman, M., & McNicholas, E. (2009). Preparing the biology teachers of the future – starting today. In A. Collins & N. Gillespie (Eds.), *The continuum of secondary science teacher preparation: Knowledge, questions and research recommendations*. Boston: Sense.
- Bybee, R., **Powell, J.C.** & Trowbridge, L., (2008). *Teaching Secondary School Science: Strategies for Developing Scientific Literacy* (9th edition). Columbus, OH: Prentice Hall Publishing/Merrill Education.
- Powell, J.C.** (May 2007). BSCS at 50 Years: Looking Forward for Another 50 Years. *American Biology Teacher*.*
- Bybee, R.W., Taylor, J.A., Gardner, A., Van Scotter, P. **Powell, J.C.**, Westbrook, A. & Landes, N. (June, 2006). *The BSCS 5E Instructional Model: Origins and Effectiveness*. A report prepared for the Office of Science Education, National Institutes of Health. Published at www.bscs.org/library/BSCS_5E_Model_Full_Report2006.pdf
- Singleton, L. (2006). Examining Fundamental Beliefs about Learning: An Interview with **Janet Carlson Powell**. *Trainers Times*, 10(2), 9-10.
- Taylor, J., **Powell, J.C.**, Bess, K., & Lamb, T. (2005). Examining the professional growth of out-of-field physics teachers: Findings from a pilot study. *Journal of Physics Teacher Education Online*, 2(4), 16-22.*
- Trowbridge, L., Bybee, R., & **Powell, J.C.** (2004). *Teaching Secondary School Science: Strategies for Developing Scientific Literacy* (8th edition). Columbus, OH: Prentice Hall Publishing/Merrill Education.
- Taylor, J. A., **Powell, J.C.**, Van Dusen, D. R., Pearson, B., Bess, K., Schindler, B., & Ezell, D. (2005). Rethinking the continuing education of science teachers: An example of transformative, curriculum-based professional development. In R. E. Yager (Ed.) *Exemplary science: Best practices in professional development* (pp. 203-211). Arlington, VA: NSTA Press.
- Taylor, J. A., Van Dusen, D. R., Schindler, B. J., Pearson, B., Bess, K., & **Powell, J.C.** (2003). Supporting large-scale curriculum reform through standards-based professional development. *The Physics*

*Teacher.**

- Bybee, R. W., Short, J. B., Landes, N. M. & **Powell, J.C.** (2003). *Leadership and Professional Development in Science Education: New Possibilities for Enhancing Teacher Learning*. RoutledgeFalmer Publishers. Perth, Australia.
- Powell, J.C.** & Anderson, R.D. (2002). "Changing teachers' practice: curriculum materials and science education reform in the USA," *Studies in Science Education*.37, 107-135.*
- Powell, J.C.**, Landes, N. M., & Short, J.B. (2002) Curriculum Reform, Professional Development, and Powerful Learning. In *2002 NSTA Yearbook*. R. Bybee (Ed.). Washington, D.C.: NSTA
- Powell, J.C.** & Block-Gandy, L. (2001). "When Partnerships Work," *Cases in Science Education*, Koballa, Tippins, and Nicols (Eds.). Merrill/Prentice Hall Publishing.
- Trowbridge, L., Bybee, R., & **Powell, J.C.** (2000). *Teaching Secondary School Science: Strategies for Developing Scientific Literacy* (7th edition). Columbus, OH: Prentice Hall Publishing/Merrill Education.
- Christensen, J. & **Powell, J.C.** (2000). *Global Science* (5th edition). Dubuque, IA: Kendall/Hunt Publishing.
- Powell, J.C.** & Bush, J. B. (Summer, 1998). *Norms of Exemplary Practice for the Teaching and Learning of Mathematics and Science*. Denver, CO: Project CONNECT.
- Powell, J.C.** (October, 1996). *BSCS Biology: A Human Approach and the National Science Education Standards*. Paper commissioned by CSMEE, National Research Council.
- Shroyer, G., Backe, K., & **Powell, J.C.** (1995). *Developing a science curriculum that addresses the learning preferences of male and female middle level students*. [Monograph]. National Association for Research in Science Teaching.*
- Powell, J.C.** (1993). "What does it mean to *have* authentic assessment?" *Middle School Journal*, 25(2), 36-42.
- Bybee, R., **Powell, J. C.**, Ellis, J., Giese, J., Parisi, L. & Singleton, L. (1991). Integrating the history and nature of science and technology in science and social studies curriculum, *Science Education*, 75(1), 143-155.*
- Carlson, J.** (1986). Methods of teaching STS topics. In R. Bybee (Ed). *Science, Technology, Society, 1985 NSTA Yearbook*. Washington, DC: National Science Teachers Association.
- Bybee, R., **Carlson, J.**, & McCormack, A. (1984). An agenda for action. In R. Bybee, J. Carlson, & A. McCormack (Eds.), *Redesigning Science and Technology Education, 1984 NSTA Yearbook*. Washington, DC: National Science Teachers Association.
- Carlson, J.** (1984). Improving instructional practices in science. In R. Bybee, J. Carlson, & A. McCormack (Eds.), *Redesigning Science and Technology Education, 1984 NSTA Yearbook*. Washington, DC: National Science Teachers Association.
- Bybee, R., **Carlson, J.**, & McCormack, A. (1984). Science and technology education: A review of contemporary reports. In R. Bybee, J. Carlson, & A. McCormack (Eds.), *Redesigning Science and Technology Education, 1984 NSTA Yearbook*. Washington, DC: National Science Teachers Association.

Presentations: Papers, Seminars, and Workshops

- Carlson, J. (November 2018). *Productive Discussion to Build Student Agency, Authority, & Identity*. A workshop for the staff of John Monash Science School, Australia.
- Carlson, J. (November 2018). *Practice-Based Professional Learning: Key Components to Supporting the Development of Core Practices*. A workshop for teacher mentors, Monash University, Australia.
- Carlson, J. (October 2018). *Improving Instruction: A Core Practice Perspective on Academic Discussion*. A workshop for secondary teachers. Monash University, Australia.
- Borko, H & **Carlson, J.** (April 2018). *Supporting and Sustaining Productive Research-Practice Partnerships*

- in STEM*. Presentation at 2018 AERA Annual International Conference, New York, NY.
- Zummo, L. & **Carlson, J.** (March 2018). *Teacher Noticing via Video Annotation in a Virtual Coaching Program*. Paper presented at 2018 NARST Annual International Conference, Atlanta, GA.
- Berry, A., **Carlson, J.**, Nilsson, P. & Van Driel, J. (August 2017). *Analysing Science Teachers' Pedagogical Content Knowledge: A Report on the second PCK Summit*. Presentation at 2017 European Science Education Association [ESERA] Biannual Conference, Dublin, Ireland.
- Carlson, J.** & Skiles, S. (April 2017). *The impact of video-based coaching: Sadie's story*. Paper presented at 2017 NARST Annual International Conference, San Antonio, TX.
- Carlson, J.**, Jarry-Shore, M., Hull Barnes, E., & Ellsworth, A. (March 2017). *All students & teachers as math learners: A partnership to refine and implement two interconnected models*. Presentation at Stanford-SFUSD Annual Partnership Meeting, Stanford, CA.
- Carlson, J.** & Gess-Newsome, J. (December 2016). *Project PRIME: Measuring PCK in thought and deed*. Paper presented at the International PCK Summit II: Analysing Science Teachers' Pedagogical Content Knowledge: Digging into the Data, Lorentz Center, University of Leiden, The Netherlands.
- Davis, E.A., Kloser, M., Wells, A., Windschitl, M., **Carlson, J.** (April 2016). *Teaching the practice of leading sense-making discussions in science: Using Rehearsals*. Paper presented at 2016 AERA Annual International Conference, Washington, D.C.
- Borko, H. & **Carlson, J.** (April 2016). *Design-based implementation research: Adapting a professional development leadership model with a school district*. Paper presented at 2016 AERA Annual International Conference, Washington, D.C.
- Carlson, J.** (April 2015). *Policy trends in curriculum reform A US perspective*. Paper presented at 2015 NARST Annual International Conference, Chicago, IL.
- Carlson, J.** (April 2014). *PCK in biology teachers resulting from professional development and educative curriculum materials*. Paper presented at 2014 AERA Annual International Conference, Philadelphia, PA.
- Carlson, J.** (March 2014). *Virtual participation in the PCK Summit: Web-based resources for researchers*. Paper presented at 2014 NARST Annual International Conference, Pittsburgh, PA.
- Carlson, J.** (September 2013). *Developing pedagogical content knowledge: The role of transformative professional development and educative curriculum materials*. Paper presented at the European Science Education Research Association Conference, Nicosia, Cyprus.
- Carlson, J.** (April 2013). *Teacher Professional Learning in a Digital Age*. Discussant for paper set presented at the 2013 NARST Annual International Conference, Puerto Rico
- Carlson, J.**, Taylor, J. A., Kowalski, S., Wilson, C., & Getty, S. (April 2013). *Conducting Studies of Causal Effects in Science Education: Considering Trade-offs to Accommodate Methodological Requirements and the Policy Constraints Affecting Research in Schools*. Paper presented at the 2013 NARST Annual International Conference, Puerto Rico.
- Gess-Newsome, J., **Carlson, J.**, Berry, A.K., Borowski, A., Fischer, H., Henze, I., Kirschner, S., Mayhunga, E., & Park, S. (April 2013). *A Report on the PCK Summit: Current and Future Research Directions*. Paper presented at the 2013 NARST Annual International Conference, Puerto Rico.
- Kowalski, S., Taylor, J.A., Getty, S., Wilson, C., & **Carlson, J.** (April 2013). *An Efficacy Trial of Research-based Instructional Materials with Curriculum-based Professional Development*. Paper presented at the 2013 NARST Annual International Conference, Puerto Rico.
- Kruse, R., Howes, E., **Carlson, J.**, Roth, K., & Bourdelat-Parks, B. N. (April 2013). *Developing and Evaluating an Eighth Grade Curriculum Unit that Links Foundational Chemistry to Biological Growth*. Paper presented at the 2013 NARST Annual International Conference, Puerto Rico.
- Gess-Newsome, J. & **Carlson, J.** (January 2013). *An International Perspective on Pedagogical Content*

- Knowledge*. Presentation at the Association for Science Teacher Educators, Charleston, SC.
- Carlson, J.** & Bourdelat-Parks, B. (November, 2012). *Designing Effective Professional Development*. Workshop at the National Association of Biology Teachers Conference, Dallas, TX.
- Carlson, J.** (November, 2012). *Toward High School Biology*. Workshop at the National Association of Biology Teachers Conference, Dallas, TX.
- Carlson, J.** (July 2012). *How People Learn*. Interactive presentation at "Science on Tap" in Colorado Springs, CO.
- Beardsley, P. M., **Carlson, J.**, Van Scotter, P., Kowalski, S. M., Bourdelat-Parks, B. N., Getty, S. R., & Stennett, B. (March 2012). *Using Research-Based Curricula to Change how Students Learn Science*. Paper presented at the NARST Annual International Conference, Indianapolis, IN.
- Bourdelat-Parks, B. N., **Carlson, J.**, Van Scotter, P., Kowalski, S. M., Beardsley, P. M., Getty, S. R., & Stennett, B. (March 2012). *Key Features of Research-Based Science Curricula: Theory and Application*. Paper presented at the NARST Annual International Conference, Indianapolis, IN.
- Carlson, J.**, Taylor, J. A., Gardner, A. L., & Gess-Newsome, J. (March 2012). *Part 1 of the Intervention: Educative Curriculum Materials*. Paper presented at the NARST Annual International Conference, Indianapolis, IN.
- Gardner, A. L., **Carlson, J.**, & Gess-Newsome, J. (March 2012). *Part 2 of the Intervention: Curriculum-based, Transformative Professional Development*. Paper presented at the NARST Annual International Conference, Indianapolis, IN.
- Kowalski, S. M., **Carlson, J.**, Van Scotter, P., Beardsley, P. M., Bourdelat-Parks, B. N., Getty, S. R., & Stennett, B. (March 2012). *Using Research-Based Curricula to Change how Teachers Teach Science*. Paper presented at the NARST Annual International Conference, Indianapolis, IN.
- Van Scotter, P., **Carlson, J.**, Kowalski, S. M., Beardsley, P. M., Bourdelat-Parks, B. N., Getty, S. R., & Stennett, B. (March 2012). *Developing Research-Based Science Curricula: An Iterative Research and Design Process*. Paper presented at the NARST Annual International Conference, Indianapolis, IN.
- Gess-Newsome, J. & **Carlson, J.** (January 2012). Multiple lenses on the development and implementation of teacher content and pedagogical content knowledge resulting from transformative professional development. Presented at ASTE, Clearwater Beach, FL.
- Kowalski, S. M., **Carlson, J.** et al. (January 2012) *Educative Instructional Materials for Middle School Science*. Presented at ASTE, Clearwater Beach, FL.
- Carlson, J.** & Gardner, A.L. (October 2011) *Pedagogical Content Knowledge (PCK) – Jargon or a Path to Improved Student Understanding?* Presented at National Association of Biology Teachers (NABT), Anaheim, CA.
- Carlson, J.** and J. Gess-Newsome (September 2011) *Conceptions of Pedagogical Content Knowledge*. Presented at European Science Education Association (ESERA) Conference, Lyon, France.
- Gess-Newsome, J., **Carlson, J.**, Gardner, A., Stuhlsatz, M.A.M., Taylor, J.A., Wilson, C.D., Cardenas, S. & Austin, B.A. (April 2011). *Impact of Educative Materials and Transformative Professional Development on Teachers PCK, Practice, and Student Achievement*. A paper set presented at the Annual Meeting of the National Association for Research in Science Teaching Orlando, FL.
- Kowalski, S.M., **Carlson, J.** & Stennett, B.L. (April 2011). *Research-Based Multidisciplinary Science Instructional Materials for Grade 8: A Tool to Promote Equity?* A poster presented at the Annual Meeting of the National Association for Research in Science Teaching, Orlando, FL.
- Carlson, J.**, Gardner, A. (2011, March). *Looking for PCK in All the Wrong Places?* Presented at National Science Teachers Association, San Francisco, CA.
- Carlson, J.**, Gardner, A., Savill, D., Stuart, E. (March 2011). *Teachers' Voices: How Educative Curriculum Materials Help Me Teach for Understanding*. Presented at National Science Teachers Association, San Francisco, CA.

- Carlson, J.**, (February 2011). Review the Research: Teaching Science for Understanding. Presented at Arizona State University School of Life Science, Tempe, AZ.
- Carlson, J.**, (January 2011). Teaching Science for Understanding: Part 1 – reviewing the research and Part 2 – living an example. Presented at Colorado Science Education Network, Colorado Springs, CO.
- Carlson, J.**, & Gess-Newsome, J. (January 2011). Assessing Pedagogical Content Knowledge among Secondary School Science Teachers. Presented at Association for Science Teacher Education. Minneapolis, MN.
- Carlson, J.**, Gardner, A., & Stuhlsatz, M. (May 2010). The role of transformative professional development based on educative materials in affecting teacher PCK, classroom practice, and student achievement. Presented at the annual meeting of the American Educational Research Association, Denver, CO.
- Carlson, J.** (March 2010). Review the research: Teaching science for effective understanding. Presented at the annual meeting of the National Science Teachers Association, Philadelphia, PA.
- Carlson, J.**, Taylor, J. A., Kowalski, S., & Wilson, C. (March 2010). Toward a framework for studying research-based science curricula. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Philadelphia, PA.
- Carlson, J.**, & Gess-Newsome, J. (January 2010). Looking for PCK in all the wrong places? Presented at the annual meeting of the Association for Science Teacher Education, Sacramento, CA.
- Carlson, J.** (November 2009). The compelling case for quality STEM education: What do the data say? Presented at the professional development conference of the National Association of Biology Teachers, Denver, CO.
- Carlson, J.** (October 2009). The role of educative curriculum materials and professional development on teacher practice and student learning. Presented at the area conference of the National Science Teachers Association, Minneapolis, MN.
- Gess-Newsome, J., **Carlson, J.**, & Wilson, C.W. (April 2009). The role of transformative professional development based on educative materials in affecting teacher PCK, classroom practice, and student achievement. Presented at annual meeting of the National Association for Research in Science Teaching, Garden Grove, CA.
- Gess-Newsome, J., & **Carlson, J.** (March 2009). The role of educative curriculum materials and professional development on teacher practice and student learning. Presented at the annual meeting of the National Science Teachers Association, New Orleans, LA.
- Carlson, J.**, & Gess-Newsome, J. (January 2009). The impact of teacher knowledge on classroom practice and student achievement. Presented at the annual meeting of the Association of Science Teacher Educators, Hartford, CT.
- Gess-Newsome, J. & **Carlson, J.** (November, 2008). *The role of educative curriculum materials and professional development on teacher practice and student learning*. Presented at the regional conference of the National Association of Science Teachers, Portland, OR.
- Carlson, J.**, & Gess-Newsome, J. (November 2008). *Challenges of conducting research in the real world*. An interactive session presented at the National Science Foundation DRK-12 PI meeting, Washington, DC.
- Carlson, J.**, Gardner, A., & Westbrook, A. (November 2008). *What is inquiry? Setting the stage*. Presented at the annual meeting of the National Association of Biology Teachers, Memphis, TN.
- Carlson, J.**, & Spiegel, S. (2008, March). *Content deepening through inquiry*. Presented at the annual meeting of the National Science Teachers Association, Boston, MA.
- Powell, J.C.**, Gess-Newsome, J., Taylor, J., & Gardner, A. (January 2008). *The impact of professional development and educative curriculum materials on teacher knowledge, teacher practice, and*

- student achievement*. Presentation at the annual meeting of the Association for Science Teacher Education, St. Louis, MO.
- Gess-Newsome, J., **Powell, J.C.**, Taylor, J., Gardner, A. (April 2008). *Impacting teacher knowledge, teacher practice, and student achievement: The role of educative curriculum materials and professional development*. Presented at the annual meeting of the National Association of Research on Science Teaching, Baltimore, MD.
- Powell, J.C.**, Taylor, J. (April 2007). *Bridging Research on Learning and Student Achievement: The role of instructional materials*. Presented at NARST Conference, New Orleans, LA.
- Powell, J.C.**, Beardsley, P. (March 2007). *BSCS Biology: A Human Approach: Using the BSCS 5Es to Promote Real Understanding*. Presented at NSTA National Convention, St. Louis, MO.
- Powell, J.C.**, Spiegel, S. (March 2007). *PDI BSCS Pathway Session: Content Deepening Through Inquiry*. Presented at NSTA National Convention, St. Louis, MO.
- Powell, J.C.**, Gardner, A. (October 2006). *BSCS Symposium on the Teaching and Learning of Biology Part I: Focus on Learners*. Presented at NABT National Convention, Albuquerque, NM.
- Powell, J.C.**, Gardner, A. (October 2006). *BSCS Symposium on the Teaching and Learning of Biology Part II: Focus on Teachers – Using Educative Instructional Materials to Improve Pedagogical Content Knowledge*. Presented at NABT National Convention, Albuquerque, NM.
- Powell, J.C.**, Taylor, J. (April 2006). *Current Research on the Implementation of Inquiry-based Curriculum*. Presented at NSTA National Convention, Anaheim, CA.
- Powell, J.C.**, Jordan, D. (April 2006). *Learning Theory and the BSCS 5E Instructional Model*. Presented at NSTA National Convention, Anaheim, CA.
- Powell, J.C.** (April 2006). *Using Curriculum Materials Based on the 5E Instructional Model to Improve Student Understanding*. Presented at NSTA National Convention, Anaheim, CA.
- Powell, J.C.** & Spiegel, S. (April 2006). *How Can I Make My Instructional Materials More Inquiry Oriented?* Presented at NSTA National Convention, Anaheim, CA.
- Powell, J.C.** (October 2005). *A Human-Centered, Inquiry-Based Approach for Increasing Student Interest in Biology*. Presented at NABT National Convention, Milwaukee, WI.
- Powell, J.C.**, Landes, N. (April 2005). *Teaching Pre-Service Teachers to Recognize Inquiry in Instructional Materials*. Presented at NSTA National Convention, Dallas, TX.
- Powell, J.C.** (April 2005). *“E” is for Evaluate – Using Curriculum Materials Based on the 5E Instructional Model to Improve Student Understanding*. Presented at NSTA National Convention, Dallas, TX.
- Powell, J.C.**, Westbrook, A. (April 2005). *What Does It Mean to Me? Using Ecology as a Means to Improve Student Interest and Understanding of Biology*. Presented at NSTA National Convention, Dallas, TX.
- Powell, J.C.** (January 2005). *Defining the Science Education Research Matrix*, Association of Educators of Teachers of Science Annual Conference, Colorado Springs, CO.
- Powell, J.C.** (November 2004). *Learning Theory and the BSCS 5E Instructional Model*, Presented at Colorado Science Convention. Denver, CO.
- Powell, J.C.** (November 2004). *Learning Theory and the BSCS 5E Instructional Model*, Presented at NABT National Convention, Chicago, IL.
- Powell, J.C.** (November, 2004). *What Next? Informing Teaching and Improving Student Learning through Formative Classroom*. Presented at NABT National Convention, Chicago, IL.
- Powell, J.C.** (November 2004). *Improving the Quality of Inquiry-Based Science Teaching*. Presented at NABT National Convention, Chicago, IL.
- Powell, J.C.** (April 2004). *Got Data? Use it to Improve Student Learning*. Presented at NSTA National Convention, Atlanta, GA.

Invited Presentations

- Carlson, J.**, Berry, A. Cooper, R., & Chan, K. (December 2018). Developing Expertise in Teaching. A Joint University Symposium hosted at Hong Kong University.
- Carlson, J.** (November 2018). Doing Research that Matters: Illuminating the Journey. Keynote address to STEM Education Faculty at Monash University, Australia.
- Carlson, J.** & Hauser, M. (October 2017). Supporting Excellence in Teaching and Instructional Leadership. A workshop for school leaders from Norway, conducted at Stanford University.
- Carlson, J.** & Elliott, N.L. (August 2017). Improving Instruction to Promote Excellence for All. A 5-day seminar for teachers and administrators at the Letovo School, Moscow, Russia.
- Melissa Moritz, Deputy Director of the Office of STEM, US Department of Education, Shari Liss, CEO, Ignited, John Keller, Director, CSU [STAR](#) Program, **Janet Carlson**, CSET, Kenny Contreras, Mathematics Teacher, Adrian Wilcox High School, Santa Clara Unified School District. (September 2016). Panel: STEM Teacher Leadership Development: Best Practices and Current Challenges, Stanford, CA.
- Carlson, J.** & Singer, S. (October 2014). K-12 Science and Undergraduate Biology Education Reform. Keynote address at LIFE Conference, San Jose, CA.
- Carlson, J.** (August 2014). Considering the Research Base when Planning Professional Development. Featured panel speaker at annual meeting of the Astronomy Society of the Pacific.
- Carlson, J.** (November 2013) Leadership and Scientific Integrity in the Biology Classroom. Featured panel speaker during NABT 75th Anniversary Gala at Annual Conference, Atlanta, GA.
- Carlson, J.** (October 2013) Panel: What is the future of STEM education? Panel participant during Next Steps Institute, Charleston, SC.
- Carlson, J.** (November 2012). Teaching Science for Understanding: What the Data Say. Keynote address at Singapore International Science Teachers Conference.
- Carlson, J.** (November 2012). Using Inquiry to Improve Teaching. A class for master teachers. Academy of Singapore Teachers.
- Carlson, J.** (November 2012). Dialogue with Singapore Science Educators. Singapore Ministry of Education.
- Carlson, J.** (October 2011). Teaching Science so People Learn. Seminar for School of Life Science faculty at Arizona State University.
- Carlson, J.** (October 2011). Making Inquiry Authentic—Not Just a Buzz Word. Opening talk at AP Biology Symposium at National Association of Biology Teachers (NABT).
- Carlson, J.** (June 2011). Designing Effective Professional Development: Linking Curriculum & Instruction Presented at Road Map for Education in the Geographical Sciences Project, National Geographic Society, Washington, DC.
- Carlson, J.** (May 2011). STEM High School Designs Presented at Edworks 2011 Leadership Institute: Innovative Leadership for the 21st Century, Columbus, OH.
- Carlson, J.** (February 2011). Review the Research: Teaching Science for Understanding. Seminar for School Life Science at Arizona State University.
- Carlson, J.** (November 2010). Review the Research: Teaching Science for Understanding. Presented at Carleton College. Northfield, MN.
- Carlson, J.** (November 2010). Characteristics of Research-Based Curriculum and Its Effect on Learning and Practice. Presented at National Science Teacher Association Sino-US Education Forum, Shanghai, China.

Carlson vita

Carlson, J. (October, 2009). Designing Effective Professional Development. A workshop for informal educators and outreach coordinators presented at the National Association of Biology Teachers Conference, Minneapolis, MN.

Carlson, J. (October 2009). The compelling case for quality STEM education: What do the data say? Presented at the Eastern Washington Governor's Advisory Council, Ellensburg, WA.

Carlson-Powell, J. (March 2004). History of High School Science Curriculum Development. Presented at First Fact Finding Meeting for *America's Lab Report* organized by the Board on Science Education (BOSE) and the Center for Education, National Research Council (NRC).

IV. Graduate Students

Mercer University – advisor and committee chair

Angela Powell 2000

Northern Arizona University – outside committee member

Amanda Grunden 2008

Eric Regh 2009

Erin Stuart 2010

Carolyn Harris 2013

Stanford University

Barbara Born, co-advisor, since 2018

Lindsay Brown, dissertation committee member, 2016

Tina Cheuk, QP committee member, 2016

Brian Donovan, dissertation committee member, 2016

Sara Dozier, co-advisor, since 2016

Elizabeth Dyer, post-doctoral fellow, co-advisor, 2016-17

Mary Hauser, QP and Dissertation committee member, since 2015

Sarah Kavanagh, post-doctoral fellow, advisor, 2015-16

Suki Mozenter, co-advisor since 2015

Danny Pimental, co-advisor, beginning Fall 2018

Emily Reigh, QP committee member, 2018

Lynne Zummo, dissertation committee member, since 2018

V. Service

Advisory and Other Board Work

Design Team for OpenSciEd focused on developing a set of design specifications for making open access NGSS-aligned curriculum materials educative for teachers. June 2018 -- present

Stanford Board of Judicial Affairs: appointed by the Senate of the Academic Council to the 15-person standing committee composed of Stanford faculty, staff and students (both graduate and undergraduate) charged with overseeing judicial affairs including adopting or modifying bylaws specifying policies and procedures, adopting and/or modifying the Student Conduct Penalty Code, and proposing amendments to the Student Judicial Charter. Fall 2017 -- present

Carlson vita

Advisory Board: Communities Supporting Teacher Learning: Using Videocase Analysis of Teaching and Learning to Support Undergraduate Preservice Secondary Science Teachers – a 4 year project of BSCS to support changes in preservice preparation of science teachers funded by NSF’s DRK-12 program. 2017-2021

Advisory Board: Zoom In! Teaching Science with Data – a 3-year collaboration of EDC and Concord Consortium funded by NSF’s DRK-12 program to create and study a digital platform for teaching data skills in the context of familiar high school biology and earth science topics 2017-2020

Howard Hughes Medical Institute (HHMI) Science Education Advisory Board: provide advice and perspective to Science Education department. 3-year term beginning January 2016; reappointed 2018

Executive Committee of the Pacific Division of AAAS: responsible for helping to design the science education component of the annual meeting. Elected to 5-year term in June 2015

Trellis Education Board Member: contribute to the thinking of this new non-profit organization that is developing long-term models for STEM teacher education and professional learning in California. 2015 – present

Colorado Springs Science Center – Founding Member, Board of Directors, working board to establish a science center in Colorado Springs. Have launched several programs as proof of concept and begun fundraising. 2009-2017; co-chair 2015-2017

Advisory Board Member and Curriculum Reviewer: Moving Next Generation Science Standards into Practice: A Middle School Ecology Unit and Teacher Professional Development Model (Awarded by NSF to American Museum of Natural History (AMNH), the University of Connecticut, and the Lawrence Hall of Science) 2015-present

Advisory Board Member: Lexical analysis technologies to develop an efficient, valid and reliable measure of elementary science teacher pedagogical content knowledge (awarded by NSF to BSCS) 2015 – present

Knowles Science Teaching Foundation (KSTF) Alumni Advisory Board and Fellow Selection Committee: Provide advice to KSTF about how to develop programs and support for alumni of their five-year fellowship program. Participate in multi-day process to interview candidates for fellowships. (2012, 2015, 2017, 2018)

Electronic Teacher Guide Advisory Board: Serve on the advisory board of this NSF-funded project run by Science Education Center at EDC in Newton, Massachusetts. Project team is developing an online, educative teacher’s guide to support an innovative high school curriculum. (2008-2012)

Geniverse Advisory Board: The Geniverse project is creating a virtual laboratory environment through which high school students will learn about cutting-edge DNA science and bioinformatics and collaborate to solve problems using the same processes employed by scientists in the field. This project was led by Concord Consortium and includes the Jackson Laboratory, Maine Mathematics and Science Alliance (MMSA), BSCS and TERC. (2010—2013)

Carlson vita

Advisor for Making Connections: Transferring and Applying Learning Among Courses, an HHMI grant to Carleton College with a focus on redesigning and strengthening courses to ensure learning transfer. (2011)

Other Service Activities

Resident Fellow: faculty in residence at a frosh dormitory – oversee student staff and provide programming for dorm (Aug 2016 – present)
Stanford Office for Science Outreach Advisory Board (2016 – present)
Stanford Board of Judicial Affairs (Sept 2017-present)
Member of Organizing Committee for International PCK Summit II titled “Analysing Science Teachers’ Pedagogical Content Knowledge: Digging into the Data” (2015-2016)
Reviewer, Teaching and Teacher Education (2017 – present)
Reviewer, International Journal of Science Education (2015 – present)
NARST equity committee (1990-1992)
NARST External policy committee (2007-2009)
Review proposals for NARST (annually)
NSF proposal review panels (annually)
NRC Gulf Research Program proposal reviews (2018)

VI. PROFESSIONAL ORGANIZATIONS

Affiliations

American Association for the Advancement of Science (AAAS)
American Educational Research Association (AERA)
International Society for Design and Development in Education (elected as a Fellow, 2015)
European Science Education Associate (ESERA)
National Association of Biology Teachers (NABT)
National Association for Research in Science Teaching (NARST)

VII. Funded Grants*

Project Title and Description	Role	Funding Agency	Total Budget	Project Time Frame
Funding Secured while at CSET				
<i>Wipro Science Education Fellowship project:</i> a collaborative project to develop K-12 science leaders in Bay Area school districts.	PI	Subcontract with the University of Massachusetts supported by the Wipro Foundation	\$1,100,000	Jan 2018 – Aug 2022
<i>Equity in Science Education through Project-Based Learning: A Research-Practice Partnership Years 2-5</i>	PI	George Lucas Education Foundation	\$729,545	Nov 2017 – June 2020
<i>Hollyhock Fellowship Program including Leadership Development and Research, Phase 2:</i> A nationwide, competitive fellowship program focused on improving the practice and retaining early career high school teachers from high needs districts.	PI	Multiple private donors	\$6,500,000	Sept 2016 – June 2021
<i>Equity in STEM Education through Project-Based Learning:</i> In this Research-Practice Partnership, we are collaborating with San Francisco Unified School District (SFUSD) to study the effectiveness of a PBL science curriculum in changing teacher practice and student learning.	PI	George Lucas Education Foundation	\$417,000	Dec 2016 – Oct 2017
<i>Analysing Science Teachers' Pedagogical Content Knowledge: Digging into the Data:</i> An international summit designed as a working conference for PCK researchers to share data and methods to find points of intersection.	Organizing Committee	Lorentz Center at the University of Leiden, the Netherlands	\$100,000	May 2015 – Dec 2016
<i>Toward a Scalable Model of Mathematics Professional Development: A Field Study of Preparing Facilitators to Implement the</i>	Co-PI with Hilda Borko	National Science Foundation	\$2,999,941	Jan 2015 – Dec 2019

Project Title and Description	Role	Funding Agency	Total Budget	Project Time Frame
<p>Problem-Solving Cycle: A Research-Practice-Partnership with SFUSD designed to support the implementation of the district math curriculum by developing site-based Teacher Leaders.</p>				
<p>The Partnership for Excellence in Teaching and Learning in S.T.E.M. (PETALS): Partnering with San Mateo County Office of Education to provide K-8 teachers with the support to become more knowledgeable, comfortable, and confident to teach science and engineering so they can teach their students in ways that support them exploring their curiosities, making sense of phenomena, and designing solutions to solve relevant problems.</p>	<p>Co-PI with Chris Chidsey (chemistry)</p>	<p>California Department of Education</p>	<p>Total = \$2,849,646 CSET = \$ 826,505</p>	<p>Nov 2015 – June 2017</p>
<p>Supplemental funding for the Core Practice Consortium. The CPC research agenda aims to identify effective strategies for preparing novice teachers in core teaching practices, and lay the groundwork for a subsequent study of the relationship between core practices and K-12 student learning. Funds from the Spencer Foundation specifically support the production of high quality video of teacher educator practice.</p>	<p>Co-PI with Pam Grossman</p>	<p>Spencer Foundation</p>	<p>\$35,000</p>	<p>Nov 2015 – Dec 2016</p>

Project Title and Description	Role	Funding Agency	Total Budget	Project Time Frame
Technology for Equity in Learning Opportunities [TELOS]: An initiative to advance equity by creating and investigating ways that technology can increase learning opportunities for PreK-12 learners, families, and educators. https://telos.stanford.edu/	Co-PI with Brigid Barron	Donor Gift	\$4,742,149	Mar 2015 – Dec 2019
Making Sure SSTI Matters: A collaboration with SFUSD to develop summer professional development with school year follow up that aligned with district priorities.	PI	Stanford-SFUSD Partnership Grant supported by the Silvergiving Foundation	\$128,844	Sept 2014 – June 2016
Funding secured while at BSCS				
A Design Study for Multimedia Biology (collaboration with Concord Consortium)	PI	Anonymous Foundation	\$157,492	June – Sept 2012
NABT/BSCS AP Biology Leadership Academy http://bscs.org/apbio	PI	Howard Hughes Medical Institute, Pearson Foundation, and the Petritz Foundation	\$365,000	May 2012 – August 2014
A PCK Summit: Current and Future Research Directions http://pcksummit.bsccs.org/	PI	REESE, National Science Foundation Spencer Foundation	\$217,104 \$39,880	2011-2013
Toward High School Biology (subward with the American Association for the Advancement of Science) http://bscs.org/toward-high-school-biology	Co-PI	Institute for Education Studies	\$1,155,091	2010 – 2013
Inquiry Approach for Grade 8 http://bscs.org/bscs-middle-school-science-0	Co-PI	Institute for Education Studies	\$1,498,825	2008 – 2011
Measuring the Efficacy and Student Achievement of Research-based Instructional Materials in HS Multidisciplinary Science http://bscs.org/measuring-efficacy-and-student-achievement	Co-PI	Institute for Education Studies, Department of Education	\$2,632,563	2006-2010

Project Title and Description	Role	Funding Agency	Total Budget	Project Time Frame
BEST: Better Science Education for Teachers (became Project PRIME) http://bscs.org/prime	PI	Teacher Professional Continuum, National Science Foundation	\$2,301,589	2005–2010
BSCS Biology: A Human Approach http://bscs.org/bscs-biology-human-approach	Project Director	ESIE, National Science Foundation	\$3,481,078	1992-1997
Middle School Science & Technology http://bscs.org/bscs-science-technology	Project Director	Elementary, Secondary, and Informal Education, National Science Foundation	\$4,333,124	1989-1992

*The majority of proposal development work I have done has been collaborative. This list indicates proposals I had a major role in developing.