

**Susan M. Kowalski**

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**EDUCATION**

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**Ph.D., University of Minnesota, August 2007**

**Major:** Curriculum & Instruction, Science Education; **Minor:** Human Rights

Coursework includes Advanced Statistical Techniques, Research Design, Critical Examination of Curriculum in Context, Teaching Theory and Research, Equity and Policy in Science Education, Theoretical Approaches to Human Rights, Advocacy for Human Rights, Curricular Outcomes in a Diverse Society, and Critical Discourse Analysis

**M.A., University of Minnesota, Fall 2006**

**Major:** Curriculum & Instruction, Science Education

**Teaching Certification, Eastern Illinois University, Spring 1995**

**Major:** Physics Education

**Graduate Coursework, University of Minnesota, 1993**

**Major:** Physics

**B.A., Colorado College, Colorado Springs, CO, 1992**

**Major:** Physics, magna cum laude

**RESEARCH EXPERIENCE**

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**BSCS**

*Project Management, Data Analysis, and Research Design, BSCS, Colorado Springs, CO, May 2007-Present*

**PI for NSF DRK-12 1502571** (2015 – 2019) *Three Dimensional Teaching and Learning: Rebuilding and Researching an Online Middle School Curriculum to Support the NGSS.*

This is a development and research grant. We are revising a life science unit to align with the NGSS, include comprehensive teacher support materials (including classroom videos showcasing instruction), create an online professional development course using a lesson-analysis approach, and take full advantages of the affordances of an online environment.

**Co-PI for NSF PRIME 1544236** (2015 – 2018). *Planning Cluster Randomized Trials of Science Education Interventions: An Empirical Investigation of Design Parameters for Studies of Teacher Interventions.* This large-scale meta-analysis done in cooperation with Western Michigan University and Abt Associates will examine the relationships between study design characteristics and effect sizes for teacher outcomes to support a priori power analyses for science education researchers.

**PI for NSF DRK-12 1118643** (2011 – 2016) *Energy: A Multidisciplinary Approach for Teachers.* This is a development and research grant designing and studying an online professional development course for high school teachers.

**PI for NSF PRIME 1118555** (2011 – 2016) *Advancing Methodological Knowledge in STEM Education Research: An Empirical Investigation of Design Parameters for Planning Cluster Randomized Trials in Science Education*. This is a large-scale meta-analysis done in cooperation with the Peabody Research Institute at Vanderbilt University and Joseph Taylor at Abt Associates. It is the foundation of the proposed project.

**PI for DRL EAGER 1445540** (2014 – 2016) *Analyzing Funding and Publication Patterns in STEM Education Research: Establishing a Baseline for Improved Monitoring of Research to Advance STEM Education*. This is a descriptive meta-analysis of projects funded since 2001 by the IES, NSF, and NIH.

### **University of Minnesota**

*Students, Language, and Physics: Discourse in the Science Classroom*

*Dissertation Research, University of Minnesota, Minneapolis, MN, September 2006-August 2007*

Observed, audio recorded, and video recorded high school physics students during group work. Selected segments of recordings for transcription. Transcribed audio and video recordings. Analyzed transcripts using critical discourse analysis to construct coding rubrics for genres and subject positions in the conversations. Analyzed transcripts using constructed rubrics.

### **CURRICULUM DEVELOPMENT EXPERIENCE**

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#### **Energy: A Multidisciplinary Approach for Teachers**

*BSCS, Colorado Springs, CO, December 2007-Present*

Developed three science units for an online course for high school teachers. Development included writing web text and scripts for video segments, supervising classroom filming, designing interactive learning experiences, and writing storyboards for animations and simulations.

#### **Across the Sciences: A Multimedia Online Course for Teachers**

*BSCS, Colorado Springs, CO, December 2007-Present*

Developed five physical science and Earth science units for an online course for high school teachers. Development included writing web text and scripts for video segments, supervising classroom filming, designing interactive learning experiences, and writing storyboards for animations and simulations.

#### **BSCS Science: An Inquiry Approach, NanoScience Supplement**

*BSCS, Colorado Springs, CO, December 2007-Present*

Developed physical science chapter of a two-chapter NanoScience supplement for eleventh grade students. The supplement is a capstone unit to a three-year multidisciplinary science instructional sequence.

## TEACHING EXPERIENCE

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### Teaching Assistant/Lead Supervisor for Science Methods Classes

*University of Minnesota, Minneapolis, MN, Fall 2005-Spring 2007t*

Co-taught middle school practicum and secondary science methods courses with university professor and supervisors. Supervised student teachers during their student teaching experience. Provided extensive feedback on teaching techniques and lesson plans. Coordinated student teaching program with cooperating teachers. Provided detailed feedback and grades for course assignments.

### High School Science Teacher

*John F. Kennedy High School, Bloomington, MN, August 1995-June 2005*

Taught skills, general, honors, and ESL physical science. Taught general and AP physics. Designed, proposed, implemented, and co-taught an interdisciplinary physics/vocational technology course, "Mechanical Systems," for students who typically do not enroll in physics. Wrote challenging, inquiry based science curriculum for district use. Evaluated and selected textbooks for use in science classes. Organized multiple field trips involving over 100 students. Advised National Honor Society.

## PUBLICATIONS

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- Taylor, J., Furtak, E., Kowalski, S., Martinez, A., Slavin, R., Stuhlsatz, M. and Wilson, C. (2016). Emergent themes from recent research syntheses in science education and their implications for research design, replication, and reporting practices. *Journal of Research in Science Teaching*. doi: 10.1002/tea.21327
- Taylor, J. A., Getty, S., Kowalski, S. M., Wilson, C. D., Carlson, J., & Van Scotter, P. G. (2015). An efficacy trial of research-based curriculum materials with curriculum-based professional development. *American Educational Research Journal* 0002831215585962, first published on May 6, 2015 doi:10.3102/0002831215585962.
- Kowalski, S. M., Taylor, J. A., Wilson, C. D., Getty, S. R., Britton, E., Allen, R., Van Scotter, P. G., & Carlson, J. (2016). *The efficacy of research-based curriculum materials supported by curriculum-based professional development*. Manuscript submitted for publication.
- Taylor, J. A., Kowalski, S. M., Wilson, C. D., Getty, S. R., & Carlson, J. (2013). Conducting studies of causal effects in science education: Considering trade-offs to accommodate methodological requirements and the policy constraints affecting research in schools. *Journal of Research in Science Teaching*, 50(9), 1127-1141.
- 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: A randomized control trial. *Journal of Research in Science Teaching*, 47(3), 276-301.
- Taylor, J. A., Van Scotter, P., Coulson, D., Bloom, M. V., Kowalski, S. M., & Stuhlsatz, M. A. M. (2008). Assessing the impact of research-based instructional materials on student achievement. In R. W. Bybee & M. V. Bloom (Eds.), *BSCS: Measuring our success—the first 50 years of BSCS* (pp. 95-111). Colorado Springs, CO: BSCS.

## PRESENTATIONS

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- Taylor, J. A., Kowalski, S. M., Polanin, J. D., Askinas, K. A., Stuhlsatz, M. A. M., Wilson, C. D., & Wilson, S. (2016). *Investigating Science Education Intervention Effect Sizes for A Priori Power Analyses*. Paper presented at the annual meeting of the American Educational Research Association, Washington, D.C.
- Kowalski, S. M., Stennett, B., Bloom, M., Askinas, K., Lukondi, A., & Van Scotter, P. G. (2016). *Online Video-Based Lesson Analysis Professional Development for High School Science Teachers*. Paper presented at the annual meeting of the National Association for Research in Science teaching, Baltimore, MD.
- Kowalski, S. M., Stennett, B., Bloom, M., Westbrook, A., & Van Scotter, P. G. (2015). *Pairing lesson analysis with constructivism: Designing and studying an online energy course for teachers*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Chicago, IL.
- Taylor, J. A., Kowalski, S. M., Stuhlsatz, M. A. M., & Wilson, C. D. (2013, April). *Investigating Publication Bias for Recent Causal Effects Studies in Science Education*. Paper presented at the meeting of the National Association for Research in Science Teaching, Rio Grande, Puerto Rico.
- Kowalski, S. M., Taylor, J. A., Getty, S. R., Wilson, C. D., & Carlson, J. (2013). *Using Instructional Materials and Curriculum-Based Professional Development to Enhance Student Science Achievement*. Paper presented at the meeting of the American Educational Research Association, San Francisco.
- Kowalski, S. M., Carlson, J., Van Scotter, P., Beardsley, P. M., Bourdelat-Parks, B. N., Getty, S. R., & Stennett, B. (2012, April). *Using Research-Based Curricula to Change how Teachers Teach Science*. Paper presented at the meeting of the National Association for Research in Science Teaching, Indianapolis, IN.
- Kowalski, S. M., Carlson, J., Van Scotter, P., & Stennett, B. (2011, April). *Research-based Multidisciplinary Science Instructional Materials for Grade 8: A Tool to Promote Equity?* Paper presented at the meeting of the National Association for Research in Science Teaching, Orlando, FL.
- Kowalski, S. M., Van Scotter, P., Stuhlsatz, M. A., & Taylor, J. A. (2010, May). *Instructional materials, equity, and science achievement*. Paper presented at the meeting of the American Educational Research Association, Denver, CO.
- Kowalski, S. M., Stuhlsatz, M. A. M., & Taylor, J. A. (2009, April). *Using curriculum to close achievement gaps*. Paper presented at the meeting of the National Association for Research in Science Teaching, Garden Grove, CA.
- Kowalski, S. M. (2008, March). *Students, language, and physics: Discourse in the science classroom*. Paper presented at the meeting of the National Association for Research in Science Teaching, Baltimore, MD.
- Kowalski, S. M., Roehrig, G. H., & Luft, J. A. (2007, April). *Jack and Jill teach science: Transformation and reproduction of scientific discourse in high school classrooms*. Paper presented at the meeting of the American Educational Research Association, Chicago, IL.
- Kowalski, S. M., & Roehrig, G. H. (2007, January). *The persistence of traditional teaching: A case study*. Paper presented at the meeting of the Association for Science Teacher Education, Clearwater Beach, FL.