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EDUCATION

Ph.D., *University of Pittsburgh*. Cognitive Studies in Education, 2011.

B.A., *Swarthmore College*. Honors Computer Science major and Education minor, 2001.

PROFESSIONAL EXPERIENCE

Research Associate. *Center for Highly Interactive Classrooms, Curricula & Computing in Education (hi-ce), School of Education, University of Michigan*. Developing an Empirically-Tested Learning Progression for the Transformation of Matter to Inform Curriculum, Instruction and Assessment Design, supervised by Shawn Y. Stevens. 2011-2012.

Graduate Student Researcher. *Learning Research and Development Center, University of Pittsburgh*. Fostering Innovation through Robotics Exploration, supervised by Christian D. Schunn. 2010-2011.

Graduate Student Researcher. *Learning Research and Development Center, University of Pittsburgh*. Robotics Corridor Project, supervised by Christian D. Schunn. 2007-2010.

Graduate Student Researcher. *Learning Research and Development Center, University of Pittsburgh*. System-Wide Change for All Learners and Educators (SCALE) Project, supervised by Christian D. Schunn. 2003-2007.

Research Consultant. *Department of Psychology, University of Pittsburgh*. Survey of Interpersonal Influence, supervised by Wolfgang Scholl. Fall 2004.

Research Programmer. *Department of Psychology, Carnegie Mellon University*. Supervised by John R. Anderson. 2001-2003.

Undergraduate Research Assistant. *Department of Engineering, Swarthmore College*. Swarthmore College Robot Team. Supervised by Bruce A. Maxwell and Lisa A. Meeden. 1999-2000.

TEACHING EXPERIENCE

Instructor. *Department of Psychology, University of Pittsburgh.* Cognitive Psychology for Majors, Laboratory Section. Fall 2010.

Teaching Fellow. *Psychology in Education Department, University of Pittsburgh.* Psychology of Learning and Development. Fall 2006 and Fall 2007.

Teaching Assistant and Guest Lecturer. *Department of Instruction and Learning, University of Pittsburgh.* Elementary Science Methods, instructed by Jennifer L. Cartier. Fall 2005.

Professional Development Workshop Facilitator. *Madison Metropolitan School District, Madison, WI.* The Electronic Alarm System Unit. Fall 2005.

Teaching Assistant and Guest Lecturer. *Department of Psychology, University of Pittsburgh.* Cognitive Psychology for Non-majors, instructed by Christian D. Schunn. Spring 2005.

Student Teacher. *Strath Haven High School, Wallingford, PA.* Supervised by K. Ann Renninger and Joseph Blass, taught three sections of Computer Programming, two introductory and one Advanced Placement, in a suburban high school using C++. Fall 2002.

PUBLICATIONS

Refereed Journal Papers

Silk, E. M., Schunn, C. D., & Strand Cary, M. (2009). The impact of an engineering design curriculum on science reasoning in an urban setting. *Journal of Science Education and Technology, 18*(3), 209-223. doi: 10.1007/s10956-009-9144-8

Doppelt, Y., Schunn, C. D., Silk, E. M., Mehalik, M. M., Reynolds, B., & Ward, E. (2009). Evaluating the impact of a facilitated learning community approach to professional development on teacher practice and student achievement. *Research in Science & Technological Education, 27*(3), 339-354. doi: 10.1080/02635140903166026

Doppelt, Y., Mehalik, M. M., Schunn, C. D., Silk, E., & Krysinski, D. (2008). Engagement and achievements: A case study of design-based learning in a science context. *Journal of Technology Education, 19*(2), 22-39.

Qin, Y., Carter, C. S., Silk, E. M., Stenger, V. A., Fissell, K., Goode, A., & Anderson, J. R. (2004). The change of the brain activation patterns as children learn algebra equation solving. *Proceedings of the National Academy of Sciences, USA, 101*(15), 5686-5691. doi: 10.1073/pnas.0401227101

Maxwell, B. A., Meeden, L. A., Addo, N. S., Dickson, P., Fairfield, N., Johnson, N., Jones, E. G., Kim, S., Malla, P., Murphy, M., Rutter, B., & Silk, E. M. (2001). REAPER: A reflexive architecture for perceptive agents. *AI Magazine, 22*(1), 53-66.

Book Chapters and Other Papers

- Schunn, C. D., Silk, E. M., & Apedoe, X. S. (in press). Engineering in/&/or/for science education. In S. Carver & J. Shrager (Eds.), *The Journey from Child to Scientist: Integrating Cognitive Development and the Education Sciences*. Washington, D.C.: American Psychological Association.
- Silk, E. M. (2012, January). *Ends and Means: A Framework for Design, Make, and Play Learning Activities*. Paper commissioned by the New York Hall of Science's Sara Lee Schupf Family Center for Play, Science, and Technology Learning. Paper presented at the January 13, 2012 *Design, Make, Play – Growing the Next Generation of Science Innovators* workshop, New York, NY, USA.
- Silk, E. M., & Schunn, C. D. (2011, September). *A cognitive perspective on integrated STEM learning*. Paper commissioned for the National Academy of Engineering/National Research Council's *Committee on Integrated STEM Education* as part of the project *Toward Integrated STEM Education: Developing A Research Agenda*. Paper presented at the September 27, 2011 meeting, Washington, DC, USA.
- Silk, E. M. (2011). *Resources for learning robots: Environments and framings connecting math and robotics*. Ph.D. Dissertation, University of Pittsburgh, Pittsburgh, PA. Available from ProQuest Dissertations and Theses database (Publication No. AAT 3485771).
- Schunn, C. D., & Silk, E. M. (2011). Learning theories for engineering and technology education. In M. Barak & M. Hacker (Eds.), *Fostering Human Development through Engineering and Technology Education* (pp. 3-18), Rotterdam: Sense Publishers.
- Silk, E. M., Higashi, R., Shoop, R., & Schunn, C. D. (2010). Designing technology activities that teach mathematics. *The Technology Teacher*, 69(4), 21-27.
- Silk, E. M., Schunn, C. D., & Shoop, R. (2009). Synchronized robot dancing: Motivating efficiency & meaning in problem-solving with robotics. *Robot Magazine*, 17, 74-77.
- Silk, E. M., & Schunn, C. D. (2008, January). *Core concepts in engineering as a basis for understanding and improving K-12 engineering education in the United States*. Paper commissioned for the report *Engineering in K-12 Education: Understanding the Status and Improving the Prospects* and presented at the National Academy of Engineering/National Research Council workshop on K-12 Engineering Education, Washington, DC, USA.

Refereed Conference Papers/Presentations/Posters

- Silk, E. M., Higashi, R., & Schunn, C. D. (2011, June). *Resources for robot competition success: Assessing math use in grade-school-level engineering design*. Paper presented at the annual meeting of the American Society for Engineering Education, Vancouver, BC, Canada.
- Silk, E. M., & Schunn, C. D. (2011, June). *Calculational versus mechanistic mathematics in propelling the development of physical knowledge*. Paper presented at the 41st annual meeting of the Jean Piaget Society, Berkeley, CA, USA.

Silk, E. M., & Schunn, C. D. (2011, April). *Resources for learning robots: Facilitating the incorporation of mathematical models in students' engineering design strategies*. Paper presented at the annual meeting of the American Educational Research Association, New Orleans, LA, USA.

Silk, E. M., & Schunn, C. D. (2008, June). *Using robotics to teach mathematics: Analysis of a curriculum designed and implemented*. Paper presented at the annual meeting of the American Society for Engineering Education, Pittsburgh, PA, USA.

Silk, E. M., & Schunn, C. D. (2008, April). *Utilizing contrasting cases to target science reasoning and content in a design-for-science unit*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Baltimore, MD, USA.

Silk, E. M., Schunn, C. D., & Strand Cary, M. (2007, April). *The impact of an engineering design curriculum on science reasoning in an urban setting*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, New Orleans, LA, USA.

Silk, E. M., & Schunn, C. D. (2006). Learning science by participating in design: A case where multiple design subgoals interfere with systematic progress. In S. Barab, K. Hay, & D. Hickey (Eds.), *Proceedings of the 7th International Conference of the Learning Sciences* (pp. 988-989). Bloomington, IN: International Society of the Learning Sciences.

Doppelt, Y., Silk, E. M., Mehalik, M. M., Schunn, C. D., Reynolds, B., & Ward, E. (2006, April). *Evaluating the impact of a facilitated learning community approach to professional development on student achievement*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, San Francisco, CA, USA.

Conference Workshop Papers/Presentations

Maxwell, B. A., Meeden, L. A., Addo, N. S., Dickson, P., Fairfield, N., Johnson, N., Jones, E. G., Kim, S., Malla, P., Murphy, M., Rutter, B., & Silk, E. M. (2000). REAPER: A reflexive architecture for perceptive agents. *Proceedings of the AAI Workshop on Robotics*. Menlo Park, CA: AAI Press.

Maxwell, B. A., Meeden, L. A., Addo, N. S., Brown, L., Dickson, P., Ng, J., Olshfski, S., Silk, E. M., & Wales, J. (1999). Alfred: The Robot Waiter Who Remembers You. *Proceedings of the AAI Workshop on Robotics*. Menlo Park, CA: AAI Press.

Invited Conference Presentations

Silk, E. M., Schunn, C. D., Higashi, R., Shoop, R., Dietrich, A., & Reed, R. (2007, August). *The use of robotics to teach mathematics*. Robotics Educators Conference, Butler, PA, USA.

ACADEMIC SERVICE

Journal Reviewing

Reviewer. *Journal of Women and Minorities in Science and Engineering (JRLWMSE)*. 2009.

Reviewer. *Journal of Research in Science Teaching (JRST)*. 2007, 2008.

Conference Reviewing

Reviewer. *American Educational Research Association (AERA) Annual Meeting*. 2007, 2008, 2009, 2010.

Reviewer. *American Society for Engineering Education (ASEE) Annual Meeting*. 2010, 2011, 2012.

Reviewer. *Cognitive Science Society (CogSci) Annual Meeting*. 2011, 2012.

Reviewer. *International Conference of the Learning Sciences (ICLS) Annual Meeting*. 2008, 2010.

Reviewer. *National Association for Research in Science Teaching (NARST) Annual Meeting*. 2007, 2008, 2009, 2011, 2012.

OTHER RELEVANT ACTIVITIES

Interviewer. *A+ Schools, Pittsburgh, PA*. Community volunteer for the *School Works* program to interview Pittsburgh's city school principals and collect data on staffing, training, coursework, support services, resources and learning opportunities for students. 2009, 2010.

Math Tutor, *Westinghouse High School and Wilkinsburg High School, Pittsburgh, PA*. Sponsored by Pittsburgh Science of Learning Center, tutored Algebra I and II students using Cognitive Tutors. 2005-2006.