

## NANCY BUTLER SONGER

Associate Provost of STEM Education

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### EDUCATION

- Ph.D. University of California, Berkeley, CA. 1989  
*Science Education & Learning Technologies, Dr. Marcia Linn, advisor*
- M.S. Tufts University, Medford, MA. 1985 *Molecular/Developmental Biology*
- B.S. University of California, Davis, CA. 1981 *Biological Sciences*

### PROFESSIONAL EXPERIENCE

- 2023- Associate Provost of STEM Education, The University of Utah, UT.
- 2020-2023 Dean of the College of Education, The University of Utah, UT.
- 2018-2020 Distinguished University Professor, Drexel University, PA.
- 2014- 2018 Dean and Distinguished University Professor  
School of Education, Drexel University, Philadelphia, PA.
- 2004-2014 Professor, Science Education and Learning Technologies  
School of Education, University of Michigan, Ann Arbor
- 2010-2014 Director, The Center for Essential Science  
University of Michigan, Ann Arbor
- 2008-2009 Department Chair, Associate Chair of Educational Studies  
School of Education, The University of Michigan, Ann Arbor
- 1997-2003 Associate Professor, Science Education & Learning Tech  
School of Education, University of Michigan, Ann Arbor
- 1997-1999 Director, Educational Technology Program  
School of Education, University of Michigan, Ann Arbor
- 1991-1996 Assistant Professor of Science Education  
School of Education, University of Colorado, Boulder
- 1989-1990 Post-Doctoral Scholar, University of California, Berkeley  
NSF funded Computer as Lab Partner, Dr. Marcia Linn, PI.
- 1981-1989 Research Technician II CETUS Corporation, Molec. Biology  
Research Technician II ONCOGEN Corp., Molec. Biology  
Research Technician I Tufts University, Molecular Biology
- 1980 Research Technician I National Institutes of Health, Bethesda, MD.

## ***LEADERSHIP HIGHLIGHTS, EDUCATIONAL POLICY, HONORS, AND AWARDS***

### Highlights

2022	Elected Fellow, International Society of the Learning Sciences
2022	AAAS Women in STEM Superhero, American Association for the Advancement of Science
2019 -2020	Fulbright U.S. Scholar Award focused on STEM Reform, The Ministry of Science, Technology, Innovation and Communication. Brasilia, Brazil
2017- 2019	Chair (w/ B. Moulding), The National Academies of Sciences Committee, <i>Science and Engineering for Grades 6-12: Investigation and Design at the Center</i>
2013	Fulbright Specialist Award focused on STEM Reform, Turkmenistan
2012-2016	Dissertation Committee, <i>National Academy of Education/Spencer Foundation</i>
2008	Faculty Recognition Award, The University of Michigan
2006	Elected Fellow, American Association of the Advancement of Science (AAAS)
1995	National Science Foundation Presidential Faculty Fellow Awarded at The White House by President William J. Clinton
1987	University of California Regents Graduate Fellow

### Additional Leadership, Honors, and Awards

2022	Associate Editor, <i>Frontiers in Education (STEM Education)</i>
2022	Collaborator, PPBS/WGBH Boston NSF Research Coordination Network
2020, 2022	Invited Reviewer, <i>Israel Science Foundation</i> , Jerusalem, Israel
2000-2022	Panel Reviewer, <i>National Science Foundation</i> review panels
2020	Invited Reviewer, Leibniz Transfer Funding Programme, Berlin, Germany
2016-Present	Board of Directors, <i>Gooru.org</i> . Prasad Ram, Founder, CEO, Chairman
2018-2020	Editorial Board, <i>American Educational Research Journal</i> , An official journal of the American Educational Research Association (AERA)
2019	Science Advisory Board, <i>Bring Science Alive!</i> Middle School Next Generation Science Textbook Series: Adaptations, Ecosystems, Cells & Genetics, Planet Earth, Space, Weather & Climate, Forces & Energy, Matter, and Waves
2018	Chair, The National Academies of Sciences, Engineering & Medicine Review Panel, <i>Citizen Science and Scientific Literacy</i> . Gulf Research Program
2018	Distinguished Scholar, Innovation Spotlights Project Advisor, Digital Promise Global. Dr. Barbara Means, Director
2018-2019	Program Committee and Meta-Reviewer, CSCL'19 Meeting, Lyon, France
2017-2020	Board of Directors, <i>The Philadelphia Education Fund</i> . F. Jimenez, President
2016-2017	External Expert in Science Assessment, state of Delaware, USA
2015-2019	Fellow of the International Society for Design and Development in Education
2012-2014	Committee Member, The National Academies of Sciences, Engineering and Medicine, <i>Assessing Next Generation Science Standards</i>
2013-2014	Assessment Expert, <i>Smithsonian Science Education Center</i> , Washington D.C.
2010-2014	Senior Associate Editor, <i>The Journal of Research in Science Teaching</i>
2011-2014	Data Team, <i>American Education Research Association</i> Data Sharing Project

2005-2012	Executive Officer, <i>The International Society of the Learning Sciences</i>
2008, 11, 14	<i>National Science Foundation</i> Committee of Visitors
2008-2013	Advisory Panel, <i>The College Board Advanced Placement (AP) Biology Redesign</i>
2007-2009	Advisory Panel, <i>The College Board Pre-Advanced Placement (AP) Committee</i>
2005	Exhibitor, <i>The United States House of Representatives</i> STEM Exhibit Representing Coalition for NSF Funding and AERA
2005	Testimony, <i>The United States House of Representatives</i> , Challenges to American Competitiveness in Math and Science
2001	Testimony, <i>The United States House of Representatives</i> Committee on Education and the Workforce
2000	Recipient, <i>United States Department of Education</i> Promising Ed Tech Award
2000	Computerworld Smithsonian Laureate and Exhibitor
1995	National Association for Research in Science Teaching (NARST) <i>Early Career Research Award</i>
1995	University of Colorado <i>Outstanding Science Educator Award</i>
1992	University of Colorado <i>Junior Faculty Development Award</i>

#### **GRANTS AND CONTRACTS (Total 78M USD)**

2019-2024 **Principal Investigator**, National Science Foundation DRK-12 (2125844) Life Right Here and Everywhere: Case Studies of Next Generation Science Instructional, Assessment and Professional Development Materials Implemented in Two Diverse Middle School Settings. Co-PIs: Prasad Ram, Tanya Dewey. (\$2,975,000.)

2018-2022 **Principal Investigator of sub-contract**, USAID Egypt, STEM Teacher Education and School Strengthening Activity (STESSA) focused on STEM Teacher Education in Egypt. PI: F. Joseph Merlino. (\$ 25,000,000. total grant).

2016-2019 **Principal Investigator**, National Science Foundation ITEST (1614511). Kids as Urban Scientists: Mapping the Biodiversity of the Philadelphia Promise Zone. Co-PIs: Nancy Peter and Winifred Black. (\$1,174,805.)

2018-2021 **Principal Investigator** with Dr. Sarah Ulrich, Project Director. Drexel University/ School District of Philadelphia Partnership: Philadelphia Teacher Residency (PTR) Pennsylvania Department of Education. (\$710,275)

2017-2018 **Co-Principal Investigator**, United States Department of Education, Philadelphia Promise Neighborhood grant Co-PIs: Lucy Kerman-Drexel, School District of Philadelphia and City of Philadelphia (\$29,999,814).

2016-2019 **Principal Investigator**, Dragons Teach Middle Years: Middle School Teachers for Urban Schools. Philadelphia School Partnership. (\$1,200,000.)

2015-2017 **Principal Investigator**, Teacher Preparation Transformation. National Center for Teacher Residencies. Bill & Melinda Gates Foundation (\$41,666.)

2014-2017 **Principal Investigator**, Federal Gear UP grant, U.S. Department of Education. Science Scope and Sequence and Next Generation Science with Philadelphia Public Schools. (\$573,645.)

2009-2014 **Principal Investigator**, National Science Foundation DR K-12. Change Thinking for Global Science: Fostering and evaluating inquiry thinking about the ecological impacts of climate change. Co-PIs: Phil Myers, University of Michigan Zoology and Jim Beach, Informatics, U. Kansas. (\$3,440,687.)

2006-2012 **Principal Investigator**, National Science Foundation. DeepThink: Thinking Deeply about Biodiversity through Inquiry. Co-PIs: Phil Myers and Amelia Gotwals. (\$2,974,263.)  
[http://www.edweek.org/ew/articles/2009/05/13/31detroit\\_ep.h28.html?tkn=VURF7yWfrPWeYFaB\\_MwgYMvhrkxGyAKNaA5%2BN](http://www.edweek.org/ew/articles/2009/05/13/31detroit_ep.h28.html?tkn=VURF7yWfrPWeYFaB_MwgYMvhrkxGyAKNaA5%2BN)).

2002-2006 **Co-Principal Investigator**, Interagency Education Research Initiative (IERI). (\$359,167. 6 million grant) A System of Principled Assessment Designs for Inquiry (PADI). Geneva Haertel, PI. This was pioneering work in the design of assessment instruments to measure science inquiry with assessment expert Bob Mislevy.

2001-2005 **Principal Investigator**, Interagency Education Research Initiative (IERI), BioKIDS: Kids' Inquiry of Diverse Species. Co-PI: Phil Myers. (\$ 4,564,681.) Resulted in three inquiry-fostering curricular units implemented in sequence to encompass 90% of the sixth grade science in Detroit classrooms.

2000 **Principal Investigator**, National Science Foundation, Building Capacity Among Junior Researchers in the Learning Sciences. Co-PI: Barry Fishman. (\$60,400.)

2000 **Co-Principal Investigator**, Gender and Technology Workshop. The University of Michigan Institute for Research on Women and Gender. With N Pinkard and E Davis. (\$4000.)

1998-2002 **Principal Investigator**, National Science Foundation, Researching Scaling and Accountability of On-line Science Curriculum for Maverick and Distributed Populations. Research on Education, Practice and Policy (REPP). (\$1,125,338.). This was pioneering work in scaling up reform interventions and the development of online collaborative research communities (e.g., the *One Sky*, *Many Voices* and *Hurricanes* projects).

1999 **Co-Principal Investigator**, The National Science Foundation CAREER Award: Demystifying the Program, Process and People. National Science Foundation (\$6,763.) with Yasmin Kafai, Mark Guzdial and Rodney McNair.

1996-2000 National Science Foundation, **Principal Investigator and Presidential Faculty Fellow**. REC-9553239 (\$500,000.)

1995-1998 **Co-PI and Principal Investigator of sub-contract**, Application of Computer Technology to Promote Collaborative Research Communities in K-12 Education, National

Science Foundation, Networking Infrastructure for Education (NIE) REC-95542111. With Dr. Perry Samson, Principal Investigator. (\$515,000 sub-contract; \$2.3 million grant.)

1994-1995 **Co-Principal Investigator**, National Science Foundation project: The Weather Underground: Application of Computer Technology to Science in Michigan Secondary Schools. Dr. Perry Samson, Principal Investigator. (\$25,000 sub-contract).

1995-1998 **Co-Principal Investigator**, National Science Foundation project: Enhancing Children's Understanding of Science Through Collaborative Creation of Animated Pictorial Models (\$1,060,342.) Dr. Clayton Lewis, Principal Investigator.

1995-1998 **Co-Principal Investigator**, National Science Foundation project: Innovation in Elementary Science: Two Case Studies from Japan (\$602,537.) Dr. Catherine Lewis, Principal Investigator.

1992-1996 **Principal Investigator**, National Science Foundation, Application of Advanced Technologies Program, REC-9253464. Kids as Global Scientists: The Utilization of the Internet for Middle School Atmospheric Science. Grant plus supplement (\$242,360.) This was pioneering work in partnership with scientists at NCAR to successfully develop some of the very first educational uses of the Internet for data sharing and collaborative learning.

1992 **Principal Investigator**, University of Colorado Junior Faculty Development Award project: Kids as Global Scientists: The Utilization of the Internet for Middle School Atmospheric Science (\$5,000.)

1991-1992 **Co-Principal Investigator**, Andrew W. Mellon Foundation funded project: Literacy in the Service of Action in Grades 6-8 (\$200,000.) Dr. Walter Kintsch, Principal Investigator.

## **PUBLICATIONS**

**Songer, N.B.** (2023) "Why is engineering design important for all learners?", Open Access Government April 2023, pp.300-301. <https://doi.org/10.56367/OAG-038-10193>  
<https://www.openaccessgovernment.org/article/engineering-design-important-leaners-stem/155374/>

**Songer, N.B.** (2023) Usable STEM knowledge for tomorrow's STEM problems. Open Access Government. January 2023, pp.294-295. <https://www.openaccessgovernment.org/article/usable-stem-knowledge-for-tomorrows-stem-problems/149124/> <https://doi.org/10.56367/OAG-037-10193>

Galoyan, T. and **Songer, N.B.** (2022) How do interdisciplinary teams co-construct instructional materials emphasizing both science and engineering practices? *The International Journal of Science Education* <https://doi.org/10.1080/09500693.2022.2075949>

**Songer, N.B.** & Whittington, K. (2022) Taking Action! A learning approach that empowers youth to generate solutions for their communities. *Open Access Government*. <https://edition.pagesuite->

[professional.co.uk/html5/reader/production/default.aspx?pubname=&edid=185174fe-9b9e-4606-9b77-47125dd9dad1](http://professional.co.uk/html5/reader/production/default.aspx?pubname=&edid=185174fe-9b9e-4606-9b77-47125dd9dad1)

**Songer, N.B.** (2022) Training a new generation of problem solvers: How can education programs develop the problem-solving skills of today's schoolchildren and tomorrow's STEM workforce? Open Access Government April 2022 ISSN 2516-3817. <https://www.openaccessgovernment.org/training-new-generation-problem-solvers-stem-workforce/132073/>

**Songer, N.B.**, & Kali, Y. (2022). Science Education and the Learning Sciences: A Coevolutionary Connection. In R. Sawyer (Ed.), *The Cambridge Handbook of the Learning Sciences* (Cambridge Handbooks in Psychology, pp. 486-503). Cambridge: Cambridge University Press. doi:10.1017/9781108888295.030

**Songer, N.B.** (2021) Training a new generation of problem solvers: Innovation in STEM education. Research Outreach <https://researchoutreach.org/articles/training-new-generation-problem-solvers-innovation-stem-education/>

**Songer, N.B.** and Ibarrola Recalde, G. (2021) Eco-Solutioning: The design and evaluation of a curricular unit to foster students' creation of solutions to address local socio-scientific issues. *Frontiers Educ.* 6:642320. doi: 10.3389/educ.2021.642320

**Songer, N.B.**, Newstadt, M., Luchessi, K., & Ram, P. (2020) Navigated Learning: An Approach for Differentiated Classroom Instruction Built on Learning Science and Data Science Foundations. *Human Behavior and Emerging Technologies.* (2) 1. 95-103 <https://onlinelibrary.wiley.com/doi/abs/10.1002/hbe2.169>

Moulding, B., **Songer, N.B.**, & Brenner, K. (Eds.) (2019) Science and Engineering for Grades 6-12: Investigations and Design at the Center. Washington D.C.: National Research Council. <https://www.nap.edu/catalog/25216/science-and-engineering-for-grades-6-12-investigation-and-design>

Likely, R., Moy, Magdalene, & **Songer, N.B.** (2018) Philly Scientists: Mobile Apps for Urban Youth Mapping the Biodiversity of Their Cities. *Connected Science Learning.* [csl.nsta.org/2018/06/philly-scientists/](https://csl.nsta.org/2018/06/philly-scientists/).

**Songer, N.B.** (2018) Learning Progressions. SAGE Encyclopedia of Educational Research, Measurement, and Evaluation 958-959. Washington D.C.: Sage.

Fick, S.J. & **Songer, N.B.** (2017) Characterizing Middle Grade Students' Integrated Alternative Science Knowledge About the Effects of Climate Change. *Journal of Education in Science, Environment and Health (JESEH)*, 3(2).

**Songer, N.B.** and Kali, Y. (2014) Science Education and the Learning Sciences as Coevolving Species. *Cambridge Handbook of the Learning Sciences*, 2<sup>nd</sup> edition. 565-586.

**Songer, N.B.** (2014) What is the "Messy Middle"? How Does It Inform the Teaching and Learning of Blended Learning in Science? Concept paper commissioned by ACT Inc.

Kwok, A. and **Songer, N.B.** (2014) Hearing Urban Classrooms. *The National Journal of Urban Education and Practice* (7) 1, 31-43.

Gotwals, A.W., Hokayem, H., Song, T., & **Songer, N.B.** (2013) The role of disciplinary ideas and practices in the complexity of large-scale assessment items. *Electronic Journal of Science Education* (17) 1.

Gotwals, A. W. and **Songer, N.B.** (2013) Validity evidence for learning progression-based assessment items that fuse core disciplinary ideas and science practices. *The Journal of Research in Science Teaching* 50(5), 597-626.

**Songer, N.B.**, Shah, A.M., and Fick, S. (2013) Characterizing teachers' verbal scaffolds to guide elementary students' creation of scientific explanations. *School Science and Mathematics* 113(7), 321-332.

Peters, V. and **Songer, N.B.** (2013) Evaluating the usability of a professional modeling tool repurposed for middle school learning. *Journal of Science Education and Teaching (JSET)*. DOI 10.1007/s10956-012-9422-8.

**Songer, N.B.** and Ruiz-Primo, M. (2012) Assessment and Science Education: Our essential new priority? *The Journal of Research in Science Teaching* (49) 6, 683-690.

Peters, V., Dewey, T., Kwok, A., Hammond, G., and **Songer, N.B.** (2012) Predicting the Impacts of Climate Change on Ecosystems: A High School Curricular Module. *The Earth Scientist*. 28:3. P.33-37.

**Songer, N.B.** and Gotwals, A. W. (2012) Guiding explanation building for elementary students at the entry points of learning progressions. *The Journal of Research in Science Teaching* (49) 2, PP. 141–165.

Gotwals, A., **Songer, N.B.** and Bullard, L. (2012) Assessing Students' Progressing Abilities to Construct Scientific Explanations. In A. Alonzo and A. Gotwals (Eds.) *Learning Progressions in Science: Current Challenges and Future Directions*. Rotterdam: Sense Publishers.

Rick, J., Devane, B., Clegg, T., Peters, V.L., **Songer, N.B.**, Goldman, S.R., Hmelo-Silver, C.E. (2011) Learning as identity formation: Implications for design, research, and practice. *Proceedings of Computer Support for Collaborative Learning*, Hong Kong.

**Songer, N.B.** (2011) Assessing Essential Science of Nascent Inquirers. In M. Mayrath, D. Robinson and J Clarke-Midura (Eds.) *Technology-Based Assessments for 21st Century Skills: Theoretical and Practical Implications from Modern Research*. Charlotte, NC: Information Age.

Gotwals, A. and **Songer, N.B.** (2010) Reasoning up and down the food chain: Using an assessment framework to do cognitive research. *Science Education*. (94) 2. P. 259-281.

**Songer, N.B.**, Kelcey, B., and Gotwals, A. (2009) When and How Does Complex Reasoning Occur? Empirically Driven Development of a Learning Progression Focused on Complex Reasoning about Biodiversity. *Journal of Research in Science Teaching*. (46)6, 610-631.

McDonald, S. and **Songer, N.B.** (2008) Enacting Classroom Inquiry: Teachers' Conceptions of Science Teaching. *Science Education* (92) 6. 973-993.

Jeong, H. & **Songer, N.B.** (2008) Understanding of scientific evidence and data collection process: Exploration of why, who, when, what, and how. In Calvin L. Petroselli (Ed.), *Science education: Issues and development*. Hauppauge, NY: Nova Science Publishers. P. 179-199.

**Songer, N.B.** (2007) Digital Resources Versus Cognitive Tools: A Discussion of Learning Science with Technology. In S. Abell and N. Lederman (Eds.) *Handbook of Research on Science Education*. Mahwah, NJ: Erlbaum. P. 471-491.

**Songer, N.B.** (2007) Rethinking Sustainability of Curricular Innovations: Notes from Urban Detroit. In B. Schneider and S. McDonald (Eds.) *Scale Up in Education: Issues in Practice*. Lanham, MD: Rowman and Littlefield. P. 165-182.

Jeong, H., **Songer, N.B.**, & Lee, S-Y. (2007) Evidentiary competence: Sixth graders' understanding for gathering and interpreting evidence in scientific investigations. *Research in Science Education* 37(1), 75- 97.

**Songer, N.B.** (2006) BioKIDS: An Animated Conversation on the Development of Curricular Activity Structures for Inquiry Science. In R. Keith Sawyer (Ed.), *Cambridge Handbook of the Learning Sciences*. New York: Cambridge University Press. P. 355-369.

**Songer, N.B.** (2006) Curriculum-Focused Professional Development: Addressing the Barriers to Inquiry Pedagogy in Urban Classrooms. In R. Floden and E. Ashburn (Eds.) *Leadership for Meaningful Learning Using Technology: What educators need to know and do*. New York: Teachers' College. P. 70-86.

Lee, H.S., **Songer, N.B.** and Lee, S.Y. (2006) Developing a Sustainable Instructional Leadership Model: A Six-Year Investigation of Teachers in One Urban Middle School. In S. Barab and K. Hay (Eds.) *The Proceedings of the International Conference of the Learning Sciences*. P. 376-382.

Gotwals, A., and **Songer, N.B.** (2006) Measuring Students' Scientific Content and Inquiry Reasoning. In S. Barab and K. Hay (Eds.) *The Proceedings of the International Conference of the Learning Sciences*. Mahwah, NJ: Erlbaum. P. 196-202.

Bao, H., Gotwals, A., **Songer, N.B.**, and Mislevy, R. (2006) Using Structured Item Response Theory Models to Analyze Content and Inquiry Reasoning Skills in BioKIDS. In X. Liu and W. Boone (Eds.) *Applications of Rasch Measurement in Science Education*. Maple Grove, Minnesota: JAM Press. P. 188-211.



**Songer, N.B.**, Mislevy, R., Gotwals, A. W. Bao, H., Kennedy, C., Hamel, L, and Haertel, G. (2005) An Illustration of PADI Design Capability in the BioKIDS Project. Technical Report, SRI International.

**Songer, N.B.** (2005) Technology as Cognitive Tool for e-Learning in Today's Classrooms. In V. Milutinovic (Ed.) *Internet, Processing, Systems and Interdisciplinary*. Academic Mind: Belgrade.

**Songer, N.B.** (2005) Congressional Testimony: Challenges to American Competitiveness in Math and Science. Committee on Education and the Workforce, Subcommittee on 21<sup>st</sup> Century Competitiveness. United States House of Representatives.

<http://edworkforce.house.gov/hearings/109th/21st/mathscience051905/songer.htm>

Gotwals, A. W., & **Songer, N.B.** (2005) The Symbiosis of Cognition, Observation and Interpretation in an Assessment System for BioKIDS. Technical Report #10, SRI International.

**Songer, N.B.** (2004) Evidence of Complex Reasoning in Technology and Science: Notes from Inner-city Detroit, Michigan, USA. In V. Milutinovic (Ed.) *Internet, Processing, Systems and Interdisciplinary*. Academic Mind: Belgrade.

Parr, C., Jones, T., and **Songer, N.B.** (2004) Evaluation of a Handheld Data Collection Interface for Science. *Journal of Science Education and Technology*. 13(2). 233-242.

**Songer, N.B.**, Gotwals, A. (2004) What Constitutes Evidence of Complex Reasoning in Science? *The Proceedings of the Sixth International Conference of the Learning Sciences (ICLS) 2004*. pp. 497-504. Mahwah, NJ: Erlbaum.

**Songer, N.B.**, Lee, H.S. and McDonald, S. (2003). Research Towards an Expanded Understanding of Inquiry Science Beyond One Idealized Standard. *Science Education* 87(4) 490-516.

Lee, H.S., and **Songer, N.B.** (2003) Making Authentic Science Accessible to Students. *International Journal of Science Education* 25 (1) 1-26.

Mislevy, B., and in alphabetical order: Chudowsky, N., Fried, R., Haertel, G., Hamel, L., Kennedy, C., Long, K., Morrison, M., Pena, P., Rosenquist, A, **Songer, N.B.**, Wenk, A. (2002) Design Patterns for Assessing Science Inquiry. Technical Report, SRI International.

Parr, C., Jones, T., and **Songer, N.B.** (2002) CyberTracker in BioKIDS: Customization of a PDA- based scientific data collection application for inquiry learning. In P. Bell, R. Stevens, and T. Satwic (Eds.), *Keeping Learning Complex: The Proceedings of the Fifth International Conference of Learning Sciences (ICLS)*, pp. 574-5. Mahwah, NJ: Erlbaum.

**Songer, N.B.**, Lee, H.S. and Kam, R. (2002) Technology-Rich Inquiry Science in Urban Classrooms: What are the barriers to inquiry pedagogy? *Journal of Research in Science Teaching* 39 (2). 128-150.

**Songer, N.B.** (2001) Congressional Testimony, Classrooms as Laboratories: The Science of Learning Meets the Practice of Teaching [www.house.gov/science/research/reshearings.htm](http://www.house.gov/science/research/reshearings.htm)

**Songer, N.B.** and McDonald, S. (2001) Smiling While Guiding Thirty Sixth Graders through Internet-based Curricula when the Internet is Down (and other lessons learned with *One Sky, Many Voices* projects). ERIC Newsletter 22(2). [www.ericit.org](http://www.ericit.org)

**Songer, N.B.**, Lee, S.Y. (2000) The Social Context Surrounding Learning with Visualization Tools. On-line publication, Center for Innovative Learning Technologies. [www.cilt.org](http://www.cilt.org)

**Songer, N.B.** (2000) Scaling Beyond Mavericks: What Do Our Experiences Tell Us? On-line publication, Center for Innovative Learning Technologies. [www.cilt.org](http://www.cilt.org)

Mueh, K. and **Songer, N.B.** (2000) Evolving with the Internet: Taking Technology for Granted- Finally. *Eisenhower National Clearinghouse for Mathematics and Science Education FOCUS: A magazine for classroom innovators*. Vol. 7(1). P. 35-37.

**Songer, N.B.** and Kam, R. (2000) How Farwell uses the Internet to help students and teachers. *Double-Click*, a publication of the Office of Educational Technology, Detroit Public Schools. 7(1). P. 12-14.

McDonald, S., and **Songer, N.B.** (2000) Online Teacher Reflection as a Scaffold to Support Reform-Based Curriculum Implementation. *Proceedings of the International Conference of the Learning Sciences (ICLS) 2000*.

Mistler-Jackson, M. and **Songer, N.B.** (2000) Student Motivation and Internet Technology: Are students empowered to learn science? *The Journal of Research in Science Teaching*. 37(5). 459-479.

Linn, M.C., Tsuchida, I., Lewis, C. and **Songer, N.B.** (2000) Beyond Fourth Grade Science: Why do US and Japanese students diverge? *Educational Researcher* 29(3), 4-14.

Pea, R. Tinker, R., Linn, M., Means, B., Bransford, J, Roschelle, J, Hi, S., Brophy, S, and **Songer, N.B.** (1999) Towards a learning technologies network. *Educational Technology Research and Development*. (29), no. 2. Also available online: [www.cilt.org/seedgrant/publications.html](http://www.cilt.org/seedgrant/publications.html) under Community Tools.

Samson, P., Masters, J., Lacy, R., Cole, D., Lee, Y., **Songer, N.B.** (1999) Hold the Java! Science Activities via Networked Multimedia CD-ROMS. *Interactive Multimedia Electronic Journal of Computer-Enhanced Learning*. <http://imej.wfu.edu/articles/1999/1/09/index.asp>

**Songer, N.B.** (1998) Beyond 'Real School' Obstacles: Ten essentials for adoption of technology-rich programs in urban middle schools. *Proceedings of the Third International Conference on the Learning Sciences (ICLS '98)*, p. 270-276.

Lee, S.Y. and **Songer, N.B.** (1998) Electronic Discourse as an Essential Component for Building and Sustaining Electronic Community of Science Learners. *Proceedings of the Third International Conference on the Learning Sciences (ICLS '98)*.

Lee, H.S. and **Songer, N.B.** (1998) What Role Do Computers Play in Technology-Rich and Technology-Poor Learning Environments? *Proceedings of the Third International Conference on the Learning Sciences (ICLS '98)*.

Luehmann, A. and **Songer, N.B.** (1998) A Theory of Design and One Successful Product: An effective model of technology-supported educational programs. *Proceedings of the Third International Conference on the Learning Sciences (ICLS '98)*.

**Songer, N.B.** (1998) Can Technology Bring Students Closer to Science? in K. Tobin and B. Fraser (Eds.) *The International Handbook of Science Education*, The Netherlands: Kluwer. pp. 333-348.

**Songer, N.B.** (1998) Kids as Global Scientists. in T. Owen and R. Owston (Eds.) *The Learning Highway: Smart Students and the Net, (A winner of the New York Public Library's Books for the Teen Age Award)*. Toronto: Key Porter Books. Chapter 22, pp. 159-162.

Hester, P.R. and **Songer, N.B.** (1997). "The techno-geeks are out to get us!" - The challenge of integrating Internet-available resources and teaching practices. In Z. Berge and M. Collins (Eds.) *Wired Together: Computer-mediated communication in K-12. (Volume 2: Case Studies)*. Cresskill, NJ: Hampton Press. Chapter 2, pp.17-25.

Linn, M.C., **Songer, N.B.**, and Eylon, B. (1996) Chapter 15: Shifts and convergences in science learning and instruction, in D. Berliner, and R. Calfee (Eds.) *The Handbook of Educational Psychology*. New York: Macmillan.

**Songer, N.B.** (1996) Exploring Learning Opportunities in Coordinated Network-Enhanced Classrooms: A case of kids as global scientists. *The Journal of the Learning Sciences* 5(4), 297-327.

McNamara, D., Kintsch, E., **Songer, N.B.** & Kintsch, W. (1996) Are Good Texts Always Better? Interactions of text coherence, background knowledge, and levels of understanding in learning from text, *Cognition and Instruction* 14 (1), 1-43.

Samson, P.J. and **Songer, N.B.** (1996) The Blue-Skies Project. *Proceedings of the Annual Meeting of Eco- Informa. Volume 10: Global Networks for Environmental Education*. 293-298. Ann Arbor: Environmental Research Institute of Michigan.

Black, L., Klingenstein, K., and **Songer, N.B.** (1995) Part One: Observations from the Boulder Valley Internet Project. *T.H.E. Journal*. 22:10. 75-80.

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**Songer, N.B.** & Devaul, H. (1995) Kids as Global Scientists: Utilizing Blue-Skies and the Internet for Global Environmental Education. Proceedings of the Annual Meeting of the Geological Society of America, 27(6), October.

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Tonso, K. and **Songer, N.B.** (1993) Teaching Science with a Child-Focused Internet Resource: What Do Teachers Need to Know, Where Do They Learn It and How Does It Change Their Teaching? *Proceedings of the Fifteenth Annual Meeting of the Cognitive Science Society*. 1005-10. Hillsdale, NJ

**Songer, N.B.** & Linn, M.C. (1992) How do students' views of the scientific enterprise influence knowledge integration? [Reprinted from *Journal of Research in Science Teaching* 28 (9) 1991] In M. K. Pearsall (Ed.) *Scope, Sequence and Coordination of Secondary School Science, Volume II: Relevant Research*, Washington, D.C.: The National Science Teachers Association.

Kintsch, E., McNamara, D., **Songer, N.B.** & Kintsch, W. (1992) Revising the Coherence of Science Texts to Improve Comprehension I, Technical Report, Institute of Cognitive Science, University of Colorado, Boulder, CO.

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**Songer, N.B.** (1989) Promoting integration of instructed and natural world knowledge in thermodynamics. Unpublished doctoral dissertation. University of California, Berkeley.

**Songer, N.B.** (1989) Technological tools for scientific thinking and discovery, *Journal of Reading, Writing and Learning Disabilities* 5, 23-41.

Friedler, Y., Nachmias, R., **Songer, N.B.** (1989) Teaching scientific reasoning skills: A case study of a microcomputer-based curriculum. *School Science and Mathematics* 89, 58-67.

### **OTHER SCHOLARLY INVENTIONS**

#### **Learning Technologies, Educational Tools, and Learning Platforms**

Dewey, T., Espinosa, R., **Songer, N.B.** (2022) Animal Diversity Web pocket guide. Colorado State University. <https://pocketguides.animaldiversity.org/#!/dashboard/places>

Stutzman, A., Smith, L., **Songer, N.B.** (2019) Philly Scientists mobile app. Philadelphia, PA: Drexel University.

Peters, V., Espinosa, R., **Songer, N.B.** (2014) SPECIES online science curricula for high school students. Ann Arbor, MI: The University of Michigan.

Peters, V., Espinosa, R., **Songer, N.B.** (2014) SPECIES online science curricula for middle school students. Ann Arbor, MI: The University of Michigan.

Parr, C.S., Espinosa, R., Jones, T., McDonald, S., **Songer, N.B.**, Myers, P. (2012) BioKIDS app. Introductory-level Cybertracker sequence for Detroit-area wildlife, augmented by web-based data summary and display. App Store app for iPhone, iPad, Android. The University of Michigan.

Espinosa, R., Dewey, T., Hammond, G., Parr, C.S., Jones, T., Pappas, J., Myers, P. and **Songer, N.B.** (2002-2011) BioKIDS Critter Catalog. The University of Michigan.

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Samson, P.J., Lacy, R., **Songer, N.B.** (1999) Kids as Global Scientists: Weather! : An Interactive Internet CD-ROM. The University of Michigan.

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#### **Original K-12 Curricular Units**

**Songer, N.B.**, Whittington, K., Newstadt, M., Corder, H., Galoyan, T., Bonneville, H., (2022) *Life Right Here and Everywhere: Investigations and Solutions*. A Middle School Curricular Unit. Salt Lake City, UT.: The University of Utah.

**Songer, N.B.**, Black, W. (2019) *Philly Scientists Exploring Our City, Instructors' Version of Solutioning Curricular Unit*. Philadelphia, PA: Drexel University.

**Songer, N.B.**, Black, W. (2019) *Philly Scientists Exploring Our City, Students' Version of Solutioning Curricular Unit*. Philadelphia, PA: Drexel University.

**Songer, N.B.**, Dewey, T., Hammond, G., Fick, S., Peters, V., Kwok, A., Morales, C., Myers, P. (2012, 2014) *Climate Change and Impacts on Ecosystems: A High School Curricular Unit*. Ann Arbor, MI: The University of Michigan.

**Songer, N.B.**, Dewey, T., Hammond, G., Fick, S., Peters, V., Kwok, A., Morales, C., Myers, P. (2012, 2014) *Climate Change and Impacts on Ecosystems: A Middle School Curricular Unit*. Ann Arbor, MI: The University of Michigan.

**Songer, N.B.**, Mathur, A., Dewey, T., Jones, T., Hammond, G., Myers, P., Bullard, L. (2009, 2010) *BioKIDS: Deep Thinking About Biodiversity Through Inquiry*. Six-week learning progression unit for 4<sup>th</sup> grade.

**Songer, N.B.**, Mathur, A., Dewey, T., Jones, T., Hammond, G., Myers, P., Bullard, L. (2009, 2010) *BioKIDS: Deep Thinking About Biodiversity Through Inquiry*. Six-week learning progression unit for 5<sup>th</sup> grade.

**Songer, N.B.**, Mathur, A., Dewey, T., Jones, T., Hammond, G., Myers, P., Bullard, L. (2008, 2009, 2010) *BioKIDS: Deep Thinking About Biodiversity Through Inquiry*. Six-week learning progression unit for 6<sup>th</sup> grade.

**Songer, N.B.**, Huber, A., Adams, K., Chang, H.Y., Lee, H.S., Jones, T. (2002, 2003, 2004, 2005) *BioKIDS: Kids' Inquiry of Diverse Species, An Eight-Week Inquiry Curriculum using Simple, Powerful Technologies*.

**Songer, N.B.**, Devaul, H., Hester, P., Crouch, S., Kam, R., Lee, H.S., Lee, S. Y., Vekiri, I. (1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003) *Kids as Global Scientists: Weather: An Eight-Week Inquiry Curriculum for Middle School Atmospheric Science*.

**Songer, N.B.**, Mistler-Jackson, M., Powell, J., Lee, H.S., Lee, Soo Young. (1996, 1997, 1998, 2000) *Hurricanes! A Four-Week Inquiry Curriculum for Middle School Atmospheric Science*.

### **Assessments to Measure Complex Reasoning in Science**

**Songer, N.B.** & Whittington, K. (2022) Assessment to Measure Next Generation Science Knowledge of Life Sciences through Science and Engineering Practices. University of Utah.

**Songer, N.B.** & Ibarro Recalde, G. (2019) Assessment to Measure Next Generation Science Knowledge of Ecology and Biodiversity for grades 4-6. Drexel University

**Songer, N.B.**, and Zaidi, S. (2013) Assessment to Measure Next Generation Science Knowledge of Climate Change. Middle School Assessment. The University of Michigan

**Songer, N.B.**, and Zaidi, S. (2013) Assessment to Measure Next Generation Science Knowledge of Climate Change. High School Assessment. The University of Michigan

Gotwals, A., **Songer, N.B.**, and Bullard, L. (2010) BioKIDS Scaffold-Rich Assessment to Measure Complex Inquiry in Biology for Fourth Grade.

Gotwals, A., **Songer, N.B.**, and Bullard, L. (2010) BioKIDS Scaffold-Rich Assessment to Measure Complex Inquiry in Biology for Fifth Grade.

Gotwals, A., **Songer, N.B.**, and Bullard, L. (2010) BioKIDS Scaffold-Rich Assessment to Measure Complex Inquiry in Biology for Sixth Grade.

### **RECENT INVITATIONS FOR INVITED ADDRESS, KEYNOTE OR SIGNIFICANT PRESENTATION**

(\*international, bold text is invited/keynote)

Presenter, Songer, N.B., Calabrese, J., Francom, R., Whittington, K., and Cordner, H. Solutioning: Harnessing Science Learning Toward the Design of Solutions. AERA Annual Meeting Division C Poster Session. April 13.

## 2022

Facilitator, STEM for All Video Showcase: Access, Inclusion, & Equity. May 10

Presenter and symposium organizer, Preparing pre-college students to solve emerging interdisciplinary problems: Integrating Life Science and Engineering in Classrooms. NARST annual meeting, Vancouver, B.C. March 29.

**Moderator, Taking Action! Student generation of solutions to local environmental problems. STEM for all MULTIPLEX February Theme of the Month Webinar Panel. February 7.**

## 2021

Opportunities and Challenges of Facilitating Educators' Understanding and Use of the Next Generation Science Standards. NARST annual meeting, April 9 (online).

## 2020

Invited #NSTAchat, National Science Teachers' Association, Using Data in the Science Classroom. September 23. <https://wakelet.com/wake/FN4IrvKV6b0IbDgHMccqBc>

Invited Address, National Academies of Sciences Committee on Enhancing Science and Engineering in Prekindergarten through Fifth Grade. Washington, D.C. May 6.

Invited Address, Conference on Teaching Excellence. Philadelphia, PA. January 8.

## 2019

Keynote Address sponsored by Texas Instruments, STEM in the Real World: What Students and Teachers Need. National Education Leadership Summit, PA. October 10.

\*Invited Address, Science, Mathematics, Engineering and Technology in Today's World. University of Brasilia, Brasilia, Brazil. August 22.

\*Invited Address, Citizen Science in the United States and Beyond. Project GLOBE Brazil, Brasilia, Brazil. August 1.

\*Invited Address, Science, Technology, Engineering and Mathematics in Today's World: Lessons from the United States and Egypt. Ministry of Science, Technology, Innovation and Education, Brasilia, Brazil. July 10.

Invited Address, K-12 Education Innovation. US News Workforce of Tomorrow Summit. National Press Club, Washington, D.C. May 22. [WATCH: 2019 Workforce of Tomorrow Conference](#)

Keynote Address sponsored by Texas Instruments, Association of State Supervisors of Mathematics (ASSM) Annual Conference. San Diego, CA. March 31.

Invited Address, Science in the Schoolyards of Detroit, Cairo and Philadelphia: What Does Investigation and Design Success Look Like? Graduate School of Education and SESAME Colloquium Series, University of California, Berkeley. March 4.

Invited Address, Science and Engineering for Grades 6-12: Investigation and Design at the Center. National Academies of Science, Engineering & Medicine Board of Science Education Meeting, Irvine, CA. USA. January 15

\* Invited Address, STEM Teacher Preparation for Egyptian Universities. Assuit University and Ministry of Education, Assuit, Egypt. January 10.

## 2018

\* Invited Address, STEM Teacher Preparation and School Strengthening Activity. Ministry of Education, Cairo, Egypt. October 17.

\* Interactive Computer Technology Presentation, Kids as Urban Scientists: Mobile Apps for Youth Mapping the Biodiversity of Urban Regions. EARLI SIG 20 & 26 Conference, The Hebrew University of Jerusalem, Jerusalem, Israel. October 10.

**Invited Panelist and Session Leader, Random Acts of STEM: Making Meaningful Connections Across the Disciplines, National Science Education Leadership Association (NSELA) Summer Leadership Institute. Philadelphia, PA. July 10.**

Invited Panelist, The Fierce Urgency of Now: What can colleges and universities do about education in Philadelphia? University of Pennsylvania, Philadelphia. PA. January 24.

**Expert Advisor, American Institute for Research (AIR) Conference on The Design of State Summative Assessments of the Next Generation Science Standards. Denver, CO. January 22.**

## 2017

\* Kids as Urban Scientists: Mobile Apps for Youth Mapping the Biodiversity of Urban Regions. European Science Education Research Association (ESERA) Dublin, IRE. Aug. 23

**Invited Address, US News, and World Report STEM Solutions-The National Leadership Conference. San Diego, CA. USA May 25.**

**The National Academies of Sciences, Engineering, and Medicine Committee on Supporting English Learners in STEM Subjects. Washington D.C., USA. April 10.**

Invited Committee of Visitors Review, Center for Research on Learning & Technology, The University of Indiana, Bloomington, IN. USA February.

Invited Address, Four Workshops for Delaware Lead K-12 Science Teachers. Gathering Strong Evidence Through Assessment of Next Generation Science Standards. January, April.

## ***POSTDOCTORAL SCHOLARS AND DOCTORAL STUDENTS WITH SONGER AS PRIMARY ADVISOR and current affiliations***

### **POSTDOCTORAL SCHOLARS (and current positions)**

1. Dr. Kirby Whittington, current postdoc on NSF grant. The University of Utah, USA.
2. Dr. Tamara Galoyan, Senior Researcher, Drexel University, PA. USA
3. Dr. Heisawn Jeong, Professor, Hallym University, South Korea
4. Dr. Vanessa Peters, Digital Promise, Redwood City, CA. USA
5. Dr. Michelle Reicher Newstadt, Senior Scientist, Gooru.org. Redwood City, CA. USA
6. (With P. Myers) Dr. Tanya Dewey, Research Scientist, Colorado State University, CO. USA
7. (With P. Myers) Dr. George Hammond, Research Scientist, University of Michigan, MI. USA

### **DOCTORAL STUDENTS**

8. Dr. Peter Hester, Professor of Science Education, Rider University, NJ. USA
9. Dr. Hee Sun Lee, Senior Research Scientist, Concord Consortium, Concord, MA. USA
10. Dr. Scott McDonald, Associate Professor of Science Education, Pennsylvania State University PA, USA
11. Dr. Tiffany Marra, Director Center for the Education of Women, University of Michigan MI, USA.
12. Dr. Christine Willis, Owner, Fresh Tracks R&D, Boulder, CO, USA
13. Dr. Amelia Wenk Gotwals, Associate Professor, Michigan State University, MI. USA
14. Dr. Soo-Young Lee, Associate Professor, Seoul National University of Education, Korea.
15. Ms. Pier Sun Ho, Assoc. Director of Curriculum Development, ConnectEd, Menlo Park, CA.



16. Dr. Tanya Cleveland Solomon, Chicago, IL. USA
17. Dr. Ashima Mathur Shah, Postdoctoral Scholar, Harvard University, MA. USA
18. Dr. Sarah Fick, Research Scientists, The University of Virginia, VA. USA
19. Dr. Consuelo Morales, Lecturer and Teaching Asst., University of Michigan, MI USA
20. Dr. Andy Kwok, Assistant Professor, Texas A&M University, TX. USA
21. Dr. Michelle Reicher Newstadt, Senior Scientist, Gooru. USA
22. Dr. Sania Zaidi, University of Illinois, Chicago Sr. Scientist w/Dr. James Pellegrino, IL, USA
23. Dr. Sherine Lazalow, Kaiser Permanente, Palm Springs, CA. USA
24. Guillermo Ibarro Recalde, Stevens Institute of Technology, New York, NY. USA
25. Sasha Ortiz, Drexel University, Philadelphia, PA. USA
26. Shadi Din, Drexel University, Philadelphia, PA. USA
27. Maureen Woodard, Drexel University, Philadelphia, PA. USA
28. Hamideh Talafian, Drexel University, Philadelphia, PA. USA
29. Rachel Francom, University of Utah, Research Supervisor
30. Holly Cordner, University of Utah, Research Supervisor
31. Daniel Aina, University of Utah, Research Supervisor

### ***TEACHING EXPERIENCE (grouped by topic area and target audience)***

#### Research Design and Assessment

First Year Doctoral Seminar (ED 898) School of Ed, University of Michigan

Classroom Assessment (ED 611), University of Michigan

Contemporary Ideas in Educational Assessment (ED 607) University of Michigan

#### Science Education

Theory, Research and Practice in Science Education (ED 831), Univ. of Michigan

The Roots of Science and Science Education (ED 830), University of Michigan

Teaching Elementary and Middle Science, Graduate Course University of Michigan

Elementary Science Methods, Undergraduate, University of Michigan

Elementary Science Methods, Graduate & Undergrad Courses, University of Colorado

Introductory Biology for Majors, University of California, Berkeley & Tufts University

Introduction to Bacteriology & Lab, Ft. Steilacoom Community College, Washington

The Chemistry of Life, UCB Jr. High Gifted Program University of California, Berkeley

#### Learning Sciences and Learning Technologies

Learning and Social Cognition in Science and Technology (ED 750), Univ. of Michigan

Educational Technology & Science Ed Professional Seminar (ED 898), Univ. Michigan

Visualization and Modeling in Learning (ED 833), University of Michigan

Seeing Technology in Classrooms (ED 601/603), University of Michigan

Computer-aided Design of Biochemistry Simulations, Univ. of California, Berkeley

### ***SERVICE IN URBAN SCHOOLS***

#### **Salt Lake City School District and Nebo School District, Spanish Fork, UT.**

2022-present

Songer leads a multi-stakeholder partnership to realize STEM learning in post-pandemic schools and to create, implement, and evaluate critical thinking in STEM in partnership with junior high and middle schools.

### **School District of Philadelphia (SDP)**

2014-2021

Songer led a multi-stakeholder partnership to challenge issues associated with persistent poverty through STEM education and school reform. Outcomes include: Significant improvement in state elementary mathematics tests, Drexel student teachers' participation in 91 different Philadelphia schools, significant improvements in productive use of data, and improvements in behavioral health. Work also includes partnering with School District personnel to redesign the K-12 Science Scope and Sequence and professional development (131,000 students, 18,390 teachers).

### **The Detroit Public Schools**

1996-2014

As Principal Investigator of five consecutive NSF grants focused on work in the Detroit Public Schools, Songer established and maintained strong partnerships with DPS teachers towards achievement outcomes demonstrating significant learning gains associated with our comprehensive interventions (e.g., curricular units, professional development, learning technologies, assessment instruments). We worked with some teachers and administrators up to 10 consecutive years, achieving overall impact with over 85,000 students & teachers.

### **RECENT AND SELECTED PRESS**

November 11, 2019, The great STEM debate: States can't agree on what those four letters mean, and that's a problem. <https://www.the74million.org/article/the-great-stem-debate-states-cant-agree-on-what-those-four-letters-mean-and-thats-a-problem/>

March 12, 2019, STEMconnector Science and Engineering for Grades 6-12: Investigation and Design at the Center. <https://www.stemconnector.com/qna-national-academies-amgen-foundation/>

December 18, 2018, "West Philadelphia Kids Become Philly Scientists with Drexel Biodiversity Project. Drexel NOW. <https://drexel.edu/now/archive/2018/December/West-Philadelphia-Kids-Become-Philly-Scientists-With-Drexel-Biodiversity-Project/>

July 17, 2018, National Public Radio (WHYY) article and radio story, "PA. bets on residency model to boost teacher prep programs" <https://whyy.org/articles/pa-bets-on-residency-model-to-boost-teacher-prep-programs/>

April 12, 2017, National Public Radio (WHYY) article and radio story, "Changing climate and flattening Earth: Teaching science in a 'fake news' world." WHYY Newsworks. <http://www.newsworks.org/index.php/homepage-feature/item/102974-changing-climate-and-flattening-earth-teaching-science-in-a-fake-news-world?ga=1.28029948.1395654283.1492001028>

Dec. 6, 2016, *Philadelphia Tribune*, NSF grant funded for middle school students in the Keystone Promise Zone interested in studying science, technology, engineering and math. [Link to story](#)

Nov. 4, 2016, *Notebook* story regarding Drexel's School of Education's recently acquired 1.17M National Science Foundation grant to transform West Philadelphia area students into urban scientists. [Link to story](#)

September 22, 2016, Why Kids Are Raving About 'Cool' New Philly School. Philly.com  
[http://articles.philly.com/2016-09-22/news/75470081\\_1\\_philadelphia-school-district-powel-elementary-second-high-school](http://articles.philly.com/2016-09-22/news/75470081_1_philadelphia-school-district-powel-elementary-second-high-school)

September 20, 2016, CBS News. City Celebrates 'SLAMS', A New Cutting-Edge Model of Education. <http://philadelphia.cbslocal.com/2016/09/20/city-celebrates-slams-a-new-cutting-edge-model-of-education/>

July 18, 2016 Education Week, Will 'Girly Tech' Attract More Girls to Computer Programming? By Benjamin Herold.  
[http://blogs.edweek.org/edweek/DigitalEducation/2015/07/girly\\_tech\\_girls\\_coding.html](http://blogs.edweek.org/edweek/DigitalEducation/2015/07/girly_tech_girls_coding.html)

June 19, 2012, Chronicle of Higher Education, To Change A Campus, Talk to a Dean.  
 November 24, 2014. <http://chronicle.com/article/To-Change-a-Campus-Talk-to/150197/>  
 Education Week, NAEP Reveals Shallow Grasp of Science.

May 24 & 28, 2012, Associated Press and National Public Radio. (e.g., USA Today [http://www.usatoday.com/USCP/PNI/Nation/World/2012-05-28-BCUSHigh-School-EducationHFR1st-LdWritethru\\_ST\\_U.htm](http://www.usatoday.com/USCP/PNI/Nation/World/2012-05-28-BCUSHigh-School-EducationHFR1st-LdWritethru_ST_U.htm)) and CBS Radio <http://detroit.cbslocal.com/2012/05/24/report-student-interest-growing-in-science-math/>)

July 8, 2010, The University Record Online

May 13, 2009, Education Week, Article selected as "Editor's Pick"

[http://www.edweek.org/ew/articles/2009/05/13/31detroit\\_ep.h28.html?tkn=VURF7yWfrPWeYFaB\\_MwgYMvhrkxGyAKNaA5%2BN](http://www.edweek.org/ew/articles/2009/05/13/31detroit_ep.h28.html?tkn=VURF7yWfrPWeYFaB_MwgYMvhrkxGyAKNaA5%2BN)

The University Record Online, 1.19. 2009

The University Record Online, 10. 6.2008

Education Week, 2.28. 2007

The Wall Street Journal, January 19, 2007

The University Record Online, February 8, 2006

The News Herald, October 31, 2001

Michigan Talk Radio, October 17, 2001

The Ann Arbor News, October 16, 2001, Columbus Dispatch, October 15, 2001

The New York Times, October 2, 1999

The Detroit Free Press, Detroit, MI. October 4, 1999

U.S. News and World Report, March 1999

The Wall Street Journal December 8, 1994