

KEVIN CROWLEY

School of Education
University of Pittsburgh
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ACADEMIC POSITIONS

At the University of Pittsburgh since 1997. Currently:

Associate Dean for Faculty and Research, School of Education
Professor, School of Education
Senior Scientist, Learning Research and Development Center
Co-lead, University of Pittsburgh Center for Learning in Out-of-School Environments (UPCLOSE)

Training

Postdoctoral fellow, Psychology, University of California, Santa Cruz, 1994-1997
Ph.D., Psychology, Carnegie Mellon University, 1994
M.S., Psychology, Carnegie Mellon University, 1991
B.A., Psychology and Education, Swarthmore College, 1989

AWARDS + FELLOWSHIPS + VISITING PROFESSOR

Adjunct Professor of Education, University of Oslo, Norway. 2016-present
Visiting Professor of Education, University of Tokyo, Japan. Fall 2013
William T. Grant Foundation Distinguished Fellow at the Carnegie Museum of Natural History. 2010-2013
Visiting Professor, University of Tokyo, June 2006
Roy L. Shafer Leading Edge Award, Association of Science and Technology Centers, in recognition of the UPCLOSE partnership with the Children's Museum of Pittsburgh, 2005
MetLife Promising Practice award from the Association of Children's Museums, in recognition of the UPCLOSE partnership with the Children's Museum of Pittsburgh, 2004
Visiting Professor, Nagoya University School of Education, Summer 2003
Japan Society for the Promotion of Science Visiting Fellow, Nagoya University, 1995

ADMINISTRATIVE EXPERIENCE

Associate Dean for Faculty & Research, School of Education, University of Pittsburgh, 2018-present.

Founder and Co-Lead, University of Pittsburgh Center for Learning in Out-of-School Environments (UPCLOSE), 2002-present.

Interim Chair, Administrative and Policy Studies, September 2019 – April 2020.

Chair, Learning Sciences and Policy, University of Pittsburgh, 2015 – 2018.

Chair, Cognitive Studies Ph.D. program, School of Education, University of Pittsburgh, 2002-2008.

Executive Committees, School of Education, University of Pittsburgh, 2015-present. Learning Research and Development Center, University of Pittsburgh, 2003-2007; 2015-2017.

Director of Research and Evaluation, Children's Museum of Pittsburgh, 2003-2006.

SELECTED NATIONAL AND INTERNATIONAL SERVICE

Center for the Advancement of Informal Science Education (CAISE). Co-founded and, since 2007, co-PI for an NSF-funded center that works to strengthen and connect the informal science education community by catalyzing conversation and collaboration across the field with a focus on improving practice, documenting evidence of impact, and communicating the contributions of informal science education to various stakeholders and communities.

www.informalscience.org. Founded, and for 10 years directed, the primary international location for sharing research and evaluation focused on informal learning. Now run through CAISE, the site continues to host a repository of informal learning citations, a collection of white papers and policy documents, a database of informal science projects around the world, social networking for the field as well as archives of evaluation reports from National Science Foundation informal science education projects.

National Academy of Sciences. Member of the National Academy of Sciences' Study Panel on Learning Science, Kindergarten through Eight Grade, 2004-2005. Invited speaker at National Academy of Sciences panels focusing on informal learning in 2015 (How People Learning II), 2014 (Out-of-School Time Learning), and 2005 (Learning Science in Informal Environments).

21st Century Natural History Learning

- Executive Committee and co-author: Building a Collaborative Learning Research Agenda for Natural History Museums, a project of Kings College, London and the Natural History Museum, London, United Kingdom. 2013-2016.
- Executive Committee, 21st Century Learning in Natural History Museums, Smithsonian Museum of Natural History, Washington DC, 2012.

Member of a delegation from the Association of Science and Technology Centers and the National Science Foundation to Sri Lanka for meetings to plan the National Science Center of Sri Lanka, Colombo, Sri Lanka, January, 2014.

JOURNAL EDITOR

Visitor Studies Journal: Co-editor, since 2018.

Journal of the Learning Sciences: Founding editor of the out of school learning strand 2009-2012. Editorial board, 2015-present.

American Educational Research Journal: Section on Teaching Learning and Human Development, Associate Editor, 2001-2004.

Guest editor with T. Okada, special issue on collaborative cognition, Cognitive Studies: The Bulletin of the Japanese Cognitive Science Society, 3 (4), 1996. (Issue awarded an Editorial Award by the Japanese Cognitive Science Society)

CONFERENCE ORGANIZER

Co-organizer, Advancing Informal Science Learning NSF Primary Investigator meetings, Washington DC, 2008; 2010; 2012; 2014; 2016; 2019; 2021.

Co-organizer, The Tokyo Symposium for Learning through Art, Tokyo, 2016.

Advisory Board, International Conference of the Learning Sciences, Boulder, CO, 2014.

Advisory Committee, The Learning Value of Children's Museums: Research Agenda Symposium, Washington, DC, 2013.

Co-organizer, Activating Inspiration and Creativity: The Tokyo International Symposium for Informal Learning in Art, Science, and Technology. University of Tokyo, Japan. Nov, 2013.

Co-Chair, Practice and Research Convening for Informal STEM Education, Washington, DC, 2013.

Co-Chair, Visitor Studies Association annual meeting, 2006.

Co-Chair, Creativity and Cognition, Modern Ceramic Art, Conference and Exhibition, Gifu, Japan. This conference led to recognition as a collaborator on a G-Mark Good Design Award, Special Prize of the Chairman Jury awarded to NHK and the Museum of Modern Ceramic Art, 2003.

Program Committee, Fifth International Conference of the Learning Sciences, 2002.

Co-Chair, Division C4b (out-of-school learning environments), Annual Meeting of the American Educational Research Association, April 2001.

Co-Chair, Designing for Science, an invitational conference focused on the psychology of scientific thinking in everyday, classroom, and professional contexts. Learning Research & Development Center, University of Pittsburgh, April 1998.

P E E R R E V I E W E R

American Educational Research Association (conference)

American Educational Research Association, Division K, Outstanding Dissertation Award Committee

American Educational Research Journal

British Journal of Educational Psychology

Child Development

Child Development Perspectives

Cognition & Instruction

Cognitive Psychology

Cognitive Science

Computer Human Interaction (conference)

Curator: The Museum Journal

Department of Education Institute for Education Sciences

Developmental Psychology

Discourse Processes

Equity & Excellence in Education

Human Development

Institute for Museum and Library Services

International Conference for the Learning Sciences

Journal of Cognition and Development

Journal of Creativity Research

Journal of Educational Psychology

Journal of Experimental Child Psychology

Journal of the Learning Sciences

Journal of Research on Science Teaching

Journal of Science Education and Technology

Merrill Palmer Quarterly

National Science Foundation (grant panels, ad-hocs, and site visit teams)
PLOS ONE
Science
Science Education
Social Development
Spencer Foundation
Visitor Studies Conference
Visitor Studies Journal
W.T. Grant Foundation

INVITED ADDRESSES

Academies of Youth Scientists
American Museum of Natural History
American Public Gardens Association
Association of Children's Museums
Association of Science & Technology Centers
Australian Museum, Sydney, Australia
Carnegie Museum of Natural History
Children's Museum of Pittsburgh
Conner Prairie Interactive History Park
ECSITE: The European network of science centres and museums
ExperienceSTEM, University of Colorado
Indiana University
Informal Science Education Association of Texas
Jackson Hole Symposium
Leibniz-Institut für Wissensmedien, Tübingen, Germany.
Nagoya University, Japan
National Academy of Sciences
Natural History Museum London, UK
Naturalis, Leiden, Netherlands
New York Hall of Science
Northwestern University
Roskilde University, Denmark.
Science Museum London, UK
Science Museum of Minnesota
Smithsonian Institute
Texas A&M University
University of Oslo, Norway
University of Tokyo, Japan

University of Washington, Seattle
University of Western England, Bristol, UK

ADVISORY BOARDS + CONSULTING

American Museum of Natural History
Astronomical Society of the Pacific
Association of Children's Museums
Bay Area Discovery Museum
Brown University
Carnegie Libraries of Pittsburgh
Carnegie Museum of Natural History
Chicago Children's Museum
Children's Discovery Museum of San Jose
Children's Museum of Pittsburgh
Children's Museum Research Center, Beijing, China
Conner Prairie Interactive History Park
Digital Promise
Family Communications, Inc.
Franklin Institute
Institute for Learning Innovation
Lawrence Hall of Science, University of California, Berkeley
Longitudinal Study of American Youth
Montshire Museum of Science
NASA
Natural History Museum London
New Knowledge Organization, Ltd.
New York Hall of Science
Northwestern University
Oregon Museum of Science and Industry
Oregon State University
Scholastic, Inc.
Science Museum of Minnesota
Smithsonian Institute
SRI International
Stanford University
TERC
The Andy Warhol Museum
Twin Cities Public Television
University of Washington, Seattle

William Penn Foundation

TEACHING + TRAINING

University Courses Taught:

Practitioner Inquiry II & III (EdD)
Informal Learning: Theory and Foundations (EdD)
The Future of Informal Learning (EdD)
Learning Sciences and Educational Change (PhD)
Informal Learning (PhD)
Professional Writing Seminar (PhD)
Applied Cognitive Science (PhD)
Instructional Explanations (PhD)
Instruction and Learning (PhD)
Museums as an Educational Resource (MEd/MAT)
Educational Psychology (MEd/MAT)
Designing & Using Informal Learning Environments in Science (MEd/MAT)
Technology for Elementary Education (MEd/MAT)
Growing up with New Media (MEd/MAT)
Cognitive Development (BA)
Introduction to Child Development (BA)

Ph.D. students:

Lisa Scott, 2000; Roger Taylor, 2004; Jodi Galco Fender, 2004; Kyung Youn Kim, 2009; Catherine Eberbach, 2009; Camellia Sanford, 2009; Debra Bernstein, 2010; Sasha Palmquist, 2012; Lisa Brahms, 2014; Lauren Allen, 2016; Mary Ann Steiner, 2016; Kaleen Povis, 2016; Rachel Bonnette (expected 2020); Marijke Hecht (expected 2020)

Ed.D. students:

Pamela Petro Ott (expected 2020); Kim Bambauer (expected 2020); Harriet Wortzman (expected 2020); Valeria McCrary (expected 2020); Kristina Seals (expected 2021); Katie Todd (expected 2022)

Undergraduate mentoring: 4 theses chaired, 25+ undergraduate research interns trained

2nd and 3rd grade teaching intern, The School in Rose Valley, Rose Valley, PA, 1988

PUBLICATIONS (* indicates student author)

100. Hecht, M.* & Crowley, K. (2020) Unpacking the Learning Ecosystems Framework: Lessons from the Adaptive Management of Biological Ecosystems, *Journal of the Learning Sciences*, 29:2, 264-284, DOI: [10.1080/10508406.2019.1693381](https://doi.org/10.1080/10508406.2019.1693381)
99. Knutson, K., Okada, T., & Crowley, K. (Eds.) (2020). *Multidisciplinary Approaches to Art Learning and Creativity: Fostering Artistic Exploration in Formal and Informal Settings*. Routledge.
98. Knutson, K. & Crowley, K. (2020). Growing up with art: How interest, opportunity and support shape learning pathways of visual arts professionals. In Knutson, K., Okada, T., & Crowley, K. (Eds.) (in press). *Multidisciplinary Approaches to Art Learning and Creativity: Fostering Artistic Exploration in Formal and Informal Settings*. Volume 1, Routledge Research in Arts Education Series. Routledge.
97. Steiner, M.A.*, Lyon, M., & Crowley, K. (2020). Museums that connect science and citizen: Using boundary objects and networks to encourage dialogue and collective response to wicked, socio-

- scientific problems. In P. Hetland, P. Pierroux, and L. Esborg (Eds), *A History of Participation in Museums and Archives: Traversing Citizen Science and Citizen Humanities*. Routledge.
96. Bonnette, R. N.*, & Crowley, K. (2020). Legitimate Peripheral Participation in a Makerspace for Emancipated Emerging Adults. *Emerging Adulthood*, 8(2), 144–158.
 95. Knutson, K and Crowley, C. (2020). Engaging older adults in climate science education: Making the case for relevant, neighborhood-focused interventions In P. Hetland, P. Pierroux, and L. Esborg (Eds), *A History of Participation in Museums and Archives: Traversing Citizen Science and Citizen Humanities*. Routledge.
 94. Hecht, M.*, Knutson, K., Crowley, K., Lyon, M., McShea, P., and Giarrantani, L. (2020). “How could dinosaurs be so close to the future?”: How natural history museum educators tackle deep time. *Curator*. 63 (1). 39-54.
 93. Hecht, M. *, Knutson, K, & Crowley, K. (2019). Becoming a naturalist: Interest development across the learning ecology. *Science Education*, 103 (3), 691-713.
 92. Bonnette, R.N.*, Crowley, K., Schunn, C.D. (2019). Falling in love and staying in love with science: ongoing informal science experiences support fascination for all children. *International Journal of Science Education*, 41(12), 1626-1643.
 91. Crowley, K. (2018). Are the fields of informal science education and science communication adjacent or connected? A bibliometric study of research journals from 2012 to 2016. Washington, DC: Center for Advancement of Informal Science Education.
 90. Akiva, T., Russell, J., Hecht, M.*, & Crowley, K. (2018). Leadership in Out-of-School Learning: The Educational Doctorate Program at the University of Pittsburgh. *International Journal for Research on Extended Education*
 89. Eberbach, C.E.* & Crowley, K. (2017) From Seeing to Observing: How Parents and Children Learn to See Science in a Botanical Garden, *Journal of the Learning Sciences*, 26:4, 608-642.
 88. Louw, M., Barbuto, N., & Crowley, K. (2017). Designing Learning Pathways in a Complex Learning Ecology: A Research Practice Partnership Focused on Parent Brokering. In B. DiSalvo, J. Yip, E. Bonsignore, & C. DiSalvo (Eds), *Participatory Design for Learning: Perspectives from Research and Practice*. New York, NY: Routledge. pp. 93-112.
 87. Dorph, R., Schunn, C., & Crowley, K. (2017). Crumpled molecules and edible plastic: Science learning Activation in Out-of-School Time. *Afterschool Matters*, 25, pp. 18-28.
 86. Russell, J. L., Kehoe, S.* & Crowley, K. (2017). Linking in and out-of-school learning. In K. Peppler (Ed.), *Encyclopedia of Out-of-School Learning*. Thousand Oaks, CA: Sage Publications.
 85. Allen, L. B.* & Crowley, K. (2017). Moving beyond scientific knowledge: Leveraging participation, relevance, and interconnectedness for climate education. *International Journal of Global Warming*. 12 (3 & 4), 299-312.
 84. Allen, L.B.* & Crowley, K. (2017). From acquisition to inquiry: Supporting informal educators through iterative implementation of practice. In P. Patrick (Ed), *Preparing Informal Educators: Perspectives from Science Communication and Education*. New York: Springer.
 83. Knutson, K, Lyon, M., Crowley, K., & Giarrantani, L. (2016). Flexible interventions to increase family engagement at Natural History museum dioramas. *Curator: The Museum Journal*. 59 (4), 339-352.
 82. Knutson, K. & Crowley, K. (2016). Learning in art museums: Creating and responding to art. In K. Nakakoji, H. Shindo, Y. Yamamoto, & T. Okada (Eds.), *Museums that inspire: In search of new possibilities for public cultural spaces*. Kyoto: Airi Shuppan. [in Japanese]
 81. Knutson, K. & Crowley, K. (2016) Collaborating across the university/informal boundary: Broader impacts through informal science education. In L. Avraamidou & W.-M. Roth (Eds.), *Intersections of formal and informal science*. New York, NY: Routledge.
 80. Stein, M.K., Crowley, K., & Resnick, L.B. (2016). Education policy and the learning sciences: The case for a new alliance. In M. Evans, M. Packer, & K. Sawyer (Eds.), *Reflections on the Learning Sciences*. Cambridge: Cambridge University Press.
 79. Brahm, L.* & Crowley, K. (2016). Learning to make in the museum: The role of Maker educators. In K. Peppler, E. Rosenfeld Halverson, & Y. B. Kafai (Eds). *Makeology: Makerspaces as learning environments*. New York: Routledge.

78. Brahms, L.* & Crowley, K. (2016). Making sense of making: Defining learning practices in MAKE Magazine. In K. Peppler, E. Rosenfeld Halverson, & Y. B. Kafai (Eds). *Makeology: Makers as Learners*. New York: Routledge.
77. Dillon, J., DeWitt, J., Pegram, E., Irwin, B., Crowley, K., Hayden, R., King, H., Knutson, K., Veall, D., and Zanthoudaki, M. (2016). A learning research agenda for natural history institutions. London: Natural History Museum.
<http://upclose.pitt.edu/articles/UK%20Natural%20History%20Research%20Agenda.pdf>
76. Crowley, K., Markham, L., Glass, M., & Bell, J. (2015). INCLUDES: Achieving Scale for Inclusion in STEM Synthesis Report. Download at: http://informalscience.org/research/ic-000-000-011-055/INCLUDES_Report
75. Tison Povis, K.* & Crowley, K. (2015). Family learning in object-based museums: The role of joint attention. *Visitor Studies*. 18 (2), 168-182.
74. Crowley, K., Barron, B.J., Knutson, K., & Martin, C. (2015). Interest and the development of pathways to science. In *Interest in Mathematics and Science Learning*. In K. A. Renninger, M. Nieswandt, and S. Hidi (Eds.). Washington DC: AERA.
73. Crowley, K., Pierroux, P., & Knutson, K. (2014). The museum as learning environment. In K. Sawyer (Ed.), *The Handbook of the Learning Sciences*, 2nd Edition.
72. Snyder, S., Hoffstadt, R. M., Allen, L.* , Crowley, K., Bader, D., & Horton, R. (2014). City-wide collaborations for urban climate education. In Hamilton, P. (Ed.), *Future Earth: Advancing Civic Understanding of the Anthropocene*, Geophysical Monograph Series, Vol. 197, American Geophysical Union, Washington, DC.
71. Allen, L. B.* & Crowley, K. (2014). How museum educators change: Changing notions of learning through changing practice. *Science Education*, 98 (1), 84-105.
70. Shields, P., Greenwald, E., Bell, J., Crowley, K., & Ellenbogen, K. (2014). The Palo Alto Convening on Assessment in Informal Settings: Synthesis Report. Washington, DC: Center for Advancement of Informal Science Education (CAISE). http://informalscience.org/research/ic-000-000-010-051/Palo_Alto_Synthesis_Report
69. Crowley, K. & Knutson, K. (2014). The 21st Century Natural History Learning Research Agenda. <http://informalscience.org/perspectives/blog/a-research-agenda-for-learning-in-natural-history-settings>
68. Steiner, M.A.* & Crowley, K. (2013). The natural history museum: Taking on a learning research agenda. *Curator: The Museum Journal*. 56(2): 267-272.
67. Russell, J., Knutson, K., & Crowley, K. (2013). Informal learning organizations as part of an educational ecology: Lessons from collaboration across the formal/informal divide. *Journal of Educational Change* 14(3): 259-281.
66. Louw, M. & Crowley, K. (2013). New ways of looking and learning in natural history museums: The use of gigapixel imaging to bring science and publics together. *Curator: The Museum Journal* 52(1): 87-104.
65. Giarrantani, L., Parikh, A.* , Di Salvo, B., Knutson, K. & Crowley, K. (2011). Click!: Pre-teen girls and a mixed reality role playing game for science and technology. *Nordic Journal of Digital Literacy*, 3.6, 121-138.
64. Knutson, K., Crowley, K., Russell, J., & Steiner, M.A.* (2011). Approaching art education as an ecology: Exploring the role of museums. *Studies in Art Education*, 52 (4), 310-322.
63. Knutson, K. & Crowley K. (2011). Construindo uma ponte entre Museus e Visitantes. Bial do Mercosul. Mediação traçando o territorio. Porto Allegre, 43-45. Portuguese translation of: Knutson, K. & Crowley, K. (2006). Bridging the gap between museums and visitors. *Visitor Studies Today*, 9 (3): 16-17.
62. Kim, K.Y.* & Crowley, K. (2010). Negotiating the goal of museum inquiry: How families engineer and experiment. M.K. Stein & L. Kucan (Eds). *Instructional Explanations in the Disciplines*. New York: Springer, pp. 51-65.
61. Knutson, K. & Crowley, K. (2010). Connecting with Art: How families talk about art in a museum setting. M.K. Stein & L. Kucan (Eds). *Instructional Explanations in the Disciplines*. New York: Springer, pp. 189-206.

60. Eberbach, C.E.* & Crowley, K. (2009). From Everyday to Scientific Observation: How Children Learn to Observe the Biologist's World. *Review of Educational Research*, 79 (1), 39-69.
59. Bernstein, D.* & Crowley, K. (2009). Can robots think for themselves? Identifying spaces for the exploration of children's ideas about robots. In the proceedings of Computer Human Interaction.
58. Knutson, K. & Crowley, K. (2006). Bridging the gap between museums and visitors: A response to Meszaros's 'The evil "Whatever" interpretation.' *Visitor Studies*, 9(3), 16-17.
57. DiSalvo, B.J., Crowley, K. & Norwood, R.* (2008). Learning in Context: Digital games and young black men, *Games and Culture* 3, 131-141.
56. Bernstein, D.* & Crowley, K. (2008). Searching for Signs of Intelligent Life: An Investigation of Young Children's Beliefs About Robot Intelligence. *Journal of the Learning Sciences*, 17:2, 225-247.
55. Sanford, C.*, Knutson, K., & Crowley, K. (2007). We Always Spend Time Together on Sundays: Grandparents and Informal Learning. *Visitor Studies*, 10(2), 136-151.
54. Palmquist, S.D.* & Crowley, K. (2007). From teachers to testers: How Parents Talk to Novice and Expert Children in a Natural History Museum. *Science Education*, 91(5), 712-732.
53. Fender, J. G.* & Crowley, K. (2007). How parent explanation changes what children learn from everyday scientific thinking. *Journal of Applied Developmental Psychology*, 28, 189-210.
52. Bernstein, D.*, Crowley, K. & Nourbakhsh, I. (2007). Working with a robot: Exploring relationship potential in human-robot systems. *Interaction Studies*, 8 (3), 465-482.
51. Palmquist, S. D.* & Crowley, K. (2007). Studying dinosaur learning on an island of expertise. In R. Goldman, R. Pea, B. Barron, & S. Derry (Eds.), *Video Research in the Learning Sciences* (pp. 271-286). Mahwah, NJ: Erlbaum.
50. Nourbakhsh, I., Hamner, E., E. Ayoob, Porter, E., Dunlavy, B., Bernstein, D.*, Crowley, K., Lotter, M., Shelly, S., Hsiu, T., & Clancy, D. (2006). The personal exploration rover: Educational assessment of a robotic exhibit for informal learning venues, *The International Journal of Engineering Education*, Vol. 22, No. 4, pp 777-791.
49. Nourbakhsh, I., Hamner, E., Dunlavy, B., Bernstein, D.*, & Crowley, K. (2006). Educational results of the personal exploration rover museum exhibit, In *Proceedings of ICRA 2005*, Barcelona, Spain, April.
48. Stubbs, K.*, Bernstein, D.*, Crowley, K., & Nourbakhsh, I. (2006). Cognitive evaluation of human-robot systems: A method for analyzing cognitive change in human-robot systems. In *Proceedings of IEEE International Symposium on Robot and Human Interactive Communication*, 59-65.
47. DiSalvo, B., Parikh, A.*, & Crowley, K. (2006). Developing The Ultimate Urban Adventure Game For Middle School Girls, *Proceedings of the Women in Games Conference 2006*, Teesside, UK.
46. Schunn, C.D., Crowley, K., & Okada, T. (2006). Cognitive science: Interdisciplinarity now and then. In S. J. Derry & M. A. Gernsbacher (Eds.), *Problems and Promises of Interdisciplinary Collaboration: Perspectives from Cognitive Science*. Mahwah, NJ: Erlbaum.
45. Stubbs, K.*, Bernstein, D.*, Crowley, K., & Nourbakhsh, I. (2005). Long term human-robot interaction: The personal exploration rovers and museum docents. In *Proceedings of Artificial Intelligence and Education*.
44. Nourbakhsh, I., Crowley, K., Bhave, A., Hamner, E., Hsiu, T., Perez-Bergquist, A., Richards, S., Wilkinson, K. (2005). The Robotic Autonomy Mobile Robotics Course: Robot Design, Curriculum Design and Educational Assessment, *Autonomous Robots Journal*, 18 (1), 103-127.
43. Eberbach, C.E.* & Crowley, K. (2005). From living to virtual: Learning from museum objects. *Curator*, 48 (3), 317-338.
42. Ellenbogen, K. & Crowley, K. (2005). Outside the walls: New directions in family learning research. *ASTC Dimensions*, November/December, pp. 13-14.
41. Knutson, K. & Crowley, K. (2005). Museum as learning laboratory: Developing and using a practical theory of informal learning. *Hand to Hand*, the publication of the Association of Children's Museums, 18(4), 4-5.
40. Crowley, K. & Knutson, K (2005). Museum as learning laboratory: Bringing research and practice together. *Hand to Hand*, the publication of the Association of Children's Museums, 19(1), 3-6.

39. Swartz, M. I.* & Crowley, K. (2004). Parent beliefs about teaching in a children's museum. *Visitor Studies*, 7(2), 1-16.
38. Eberbach, C.* & Crowley, K. (2004). Learning research in public gardens. *Public Garden*, 19(2), 14-17.
37. Knutson, K. & Crowley, K. (2004). Review of Behind the Scenes at the Science Museum. *Science Education*, 88 (2), 297-300.
36. Nourbakhsh, I., Hamner, E., Bernstein, D.* , Crowley, K., Porter, E., Hsiu, T., Dunlavey, B., Ayoob, E., Lotter, M., Shelly, S., Parikh, A., Clancy, D. (2004). The Personal Exploration Rover: The Ground-up Design, Deployment and Educational Evaluation of an Educational Robot for Unmediated Informal Learning Sites. Carnegie Mellon University Technical Report CMU-RI-TR-04-38
35. Nourbakhsh, I., Crowley, K. Wilkinson, K., & Hamner, E.(2003). The educational impact of the Robotic Autonomy mobile robotics course. Technical report CMU-RI-TR-03-29, Robotics Institute, Carnegie Mellon University, August, 2003. http://www.ri.cmu.edu/cgi-bin/tech_reports.cgi
34. McGregor, M. U.* , Palmquist, S.* , Schunn, C. D., & Crowley, K. (2003). Capturing Child Dinosaur Expertise With Computationally Specified Input Encoding. *Proceedings of the International Conference for Cognitive Modeling*.
33. Leinhardt, G., Knutson, K., & Crowley, K (2003). Museum Learning Collaborative redux. *Journal of Museum Education*, 28 (1), 23-31.
32. Crowley, K. (2003). Everyday explanation in museums and beyond. Proceedings of the 2003 International Conference on Creative Cognition.
31. Crowley, K. (2003). Learning new problem solving strategies by observing and explaining. In D. Fasko. (Ed.). *Critical Thinking and Reasoning: Current Theories, Research and Practice*. Cresskill, NJ: Hampton.
30. Leinhardt, G., Crowley, K., & Knutson, K. (Eds.) (2002). *Learning conversations in museums*. Mahwah, NJ: Lawrence Erlbaum Associates.
29. Leinhardt, G. & Crowley, K. (2002). Objects of learning, objects of talk: Changing minds in museums. In S. Paris (Ed.) *Multiple Perspectives on Children's Object-Centered Learning*. Mahwah, NJ: Lawrence Erlbaum Associates
28. Crowley, K. & Jacobs, M.* (2002). Islands of expertise and the development of family scientific literacy. In G. Leinhardt, K. Crowley, & K. Knutson (Eds.) *Learning conversations in museums*. Mahwah, NJ: Lawrence Erlbaum Associates.
27. Schunn, C. D., Crowley, K., & Okada, T. (2002). What makes collaborations across a distance succeed? The case of the cognitive science community. In P. Hinds & S. Kiesler (Eds.) *Distributed work: New research on working across distance using technology*. Cambridge, MA: MIT Press.
26. Crowley, K., Leinhardt, G., & Chang, C.F.* (2001). Emerging research communities and the World Wide Web: Analysis of a Web-based resource for the field of museum learning. *Computers and Education*, 36 (1), 1-14.
25. Crowley, K., Callanan, M.A., Tenenbaum, H.R.* , & Allen, E.* (2001). Parents explain more often to boys than to girls during shared scientific thinking. *Psychological Science*, 12 (3), 258-261.
24. Crowley, K., Callanan, M.A., Jipson, J.* , Galco, J.* , Topping, K.* , & Shrager, J. (2001). Shared scientific thinking in everyday parent-child activity. *Science Education*, 85 (6), 712-732.
23. Crowley, K., Schunn, C.D., & Okada, T. (Eds.) (2001). *Designing for science: Implications from everyday, classroom, and professional settings*. Mahwah, NJ: Lawrence Erlbaum Associates.
22. Crowley, K. & Galco, J.* (2001). Everyday activity and the development of scientific thinking. In K. Crowley, C. D. Schunn, & T. Okada (Eds.), *Designing for science: Implications from everyday, classroom, and professional settings*. Mahwah, NJ: Erlbaum.
21. Azmitia, M.A. & Crowley, K. (2001). The rhythms of scientific thinking: A study of collaboration in an earthquake microworld. In K. Crowley, C. Schunn, & T. Okada (Eds.) *Designing for science: Implications from everyday, classroom, and professional settings*. Mahwah, NJ: Lawrence Erlbaum Associates.
20. Crowley, K. (2000). Parent explanations during museum visits: Gender differences in how children hear informal science. *Visitor Studies*, 3 (3), 21-28.

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G R A N T S

68. National Science Foundation (DRL 1906368). Climate Rural Systems Partnership (CRSP), \$794,923, Crowley (PI), 2019-2023. Collaborative proposal with the Carnegie Museum of Natural History, \$1,254,205, Giarrantani (PI), Heller (Co-PI). Total: \$2M.

67. William Penn Foundation, Supporting the Informal Learning Initiative, Phase II, Crowley & Knutson, 2019-2022, \$624,000.
66. National Science Foundation, Center for the Advancement of Informal Science Education (CAISE). \$15,000,000. Current leadership team: J. Bell (PI); Crowley (Co-PI); Garaby (Co-PI); Storksdiel (Co-PI). 2007-2021.
65. National Science Foundation, Remake Making: Understanding Adoption and Adaptation of Facilitated Making in Libraries, \$299,495, Akiva (PI), Bowler (Co-PI), Crowley (Co-PI), Wardrip (Co-PI). 2017-2019.
64. National Science Foundation, Learning to See, Seeing to Learn: A Sociotechnical System Supporting Taxonomic Identification Activities in Volunteer-Based Water Quality Biomonitoring. \$1,690,278, 2015-2019. Louw (PI), Crowley (Co-PI).
63. National Science Foundation (IIS 1735945), Smart Spaces for Making: Networked Physical Tools to Support Process Documentation and Learning, \$132,450, Crowley, K. (PI), 2017-2019. [Collaborative Grant with M. Louw and D. Byrne at Carnegie Mellon University] Total \$350,000.
62. Spencer Foundation, The 21st Century Naturalist: A research-practice collaboration for informal science education, \$400,000, Crowley, Knutson, Giarrantani, & Tonsor, 2015-2019.
61. William Penn Foundation, Supporting the Informal Learning Initiative, \$365,670, Crowley, Knutson, Russell, 2017-2019.
60. National Science Foundation, Climate Change Education Partnership-II: Climate and Urban Systems Partnership (CUSP). \$5,600,000, 2012-2018. PI team: Schneider/Ehlich (PI), Crowley (Co-PI), & Horton (Co-PI). 2012-2019.
59. National Science Foundation, Intelligent Science Exhibits: Transforming Hands-on Exhibits into Mixed-Reality Learning Experiences, \$299,827, 2016-2019. Koedinger (PI), Crowley (Co-PI), Hudson (Co-PI).
58. Digital Promise, A Research and Practice Agenda for a Regional Learning Network, \$10,000. Crowley. 2017.
57. Children's Museum of Pittsburgh, Make Shop Research Partnership, \$120,000, Crowley (PI). 2013 to 2017.
56. American Educational Research Association, Making and Learning, Research conference grant, \$35,000. 2015-2017. Wardrip, Brahms, & Crowley.
55. National Science Foundation, Collaborative Research: Energy, Environment and Society Learning Network (ENERGY NET): Enhancing opportunities for learning using an Earth systems science framework. \$600,000, 2012-2014. Elliot (PI), Bain (Co-PI), Crowley (Co-PI); Steiner (Co-PI).
54. Grable Foundation, Designing Regional Learning Pathways, \$198,780, 2013-2014. Crowley & Schunn.
53. Sprout Fund, Pathways for Activation in Pittsburgh, \$25,000, 2013. Crowley & Schunn.
52. Carnegie Libraries of Pittsburgh, Teen Spaces for Out-of-School Learning, \$50,000, 2013-2015, Knutson (PI), Crowley (Co-PI).
51. Carnegie Museum of Natural History, Natural History Museum Research Fellows. \$72,500, 2012-2015. Crowley (PI).
50. Sprout Fund, Activation for Learning Science and Art, \$25,000, 2012. Crowley & Schunn
49. Children's Museum of Pittsburgh, Children's Museum Research Fellow. \$43,000, 2011-2012. Crowley (PI).
48. Gordon & Betty Moore Foundation, Activated Young Science Learner, \$4,000,000, 2011-2013. Schunn, Dorph, Crowley, & Shields.
47. William T. Grant Foundation, Distinguished Fellows Program: Finding a place for museums in the learning lives of youth, \$200,000, 2011-2013. Crowley.
46. National Science Foundation, Gigapixel cyberinfrastructure for participatory science learning. \$569,000, 2011-2015. Louw (PI), Crowley (Co-PI), Nourbakhsh (Co-PI), Steiner (Co-PI).

45. National Science Foundation, Building Informal Science Education: Supporting Evaluation of Exhibitions and Programs with an informalscience.org research network. \$1,400,000, 2010-2013. Crowley (PI), Knutson (Co-PI), Ellenbogen (Co-PI).
44. National Science Foundation, Urban climate education partnership, \$911,000, 2010-2012. Schneider (PI), Crowley (Co-PI), Horton (Co-PI).
43. Gordon & Betty Moore Foundation, Activated Young Science Learner Planning Grant, \$380,000, 2010-2011. Schunn, Dorph, & Crowley
42. Learning Research and Development Center Faculty Research Award, School/Community Partnerships in the 21st Century: How Digital Technologies Can Build a Culture of Learning That Extends Beyond School \$75,000, 2010-2011. Gomez, Gomez, Matsumura, & Crowley.
41. Institute for Museum and Library Services, Improving outcomes in art museums: Supporting family learning on the gallery floor, \$100,000, 2009-2012. Knutson (PI) & Crowley (Co-PI).
40. Learning Research and Development Center Faculty Research Award, School/Community Partnerships in the 21st Century: How Digital Technologies Can Build a Culture of Learning That Extends Beyond School \$75,000, 2009-2010. Crowley, Gomez, & Gomez.
39. Learning Research and Development Center Faculty Research Award, The Ecology of Educational Opportunities in Pittsburgh, \$75,000, 2009-2010 with J. Russell, K. Knutson, & W. Bickel.
38. National Science Foundation, City as Learning Lab: Spreading Technological Fluency Through Creative Robotics, \$1,900,000, 2008-2013. Crowley (PI), DiSalvo (Co-PI), Nourbakhsh (Co-PI).
37. Manchester Craftsmen's Guild, Understanding the student and community impact of arts-based youth programs, \$216,248. 2008-2010. PI's: Crowley & Knutson.
36. Carnegie Mellon University, Neighborhood Nets, \$25,000, 2007-2008. Crowley (PI). [Subaward from an Intel grant]
35. Carnegie Mellon University, Robot 250, \$61,000, 2007-2008. Crowley (PI). [Subaward from a Heinz Endowments grant]
34. Carnegie Mellon University, Robot Diaries II, \$40,000, 2007-2008, Crowley. [Subaward from a Heinz Endowments grant]
33. National Science Foundation, InformalScience.org: Building a Web Community for Informal Science, \$675,348, 2006-2008. Crowley (PI), Louw (Co-PI).
32. National Science Foundation, Supplemental funding for Conceptualizing and Assessing Web-based Informal Science Learning, \$120,000, 2006. Crowley (PI).
31. Children's Museum of Pittsburgh, How People Make Things, \$180,000, 2006-2009. Subcontract to Crowley from a National Science Foundation grant to the Children's Museum of Pittsburgh.
30. Carnegie Mellon University, Robot Diaries, \$10,000, 2006. Crowley (PI) [Subaward from a Heinz Endowments grant]
29. J. Paul Getty Trust, How do family rooms impact art gallery experience? \$32,301, 2006-2007. Crowley (PI) & Knutson (Co-PI).
28. Mattress Factory, Artistic process, individual, and community change: A study of museum outreach. \$12,000. 2006-2008. Knutson (PI) & Crowley (Co-PI).
27. Carnegie Museum of Natural History, Understanding minerals and gems: A visitor study, \$15,024, January 1, 2006 to April 30, 2006. Crowley (PI) & Knutson (Co-PI).
26. Carnegie Museum of Natural History, Biotechnology in a natural history museum, \$15,000, January 1, 2006 to October 31, 2006. Crowley (PI).
25. Carnegie Museum of Natural History, Learning Research and Evaluation for Dinosaurs in Their World. 2005-2007, \$200,000. Crowley (PI) & Palmquist (Co-PI).
24. Arts Education Collaborative, Research partnership to examine professional development for art teaching, \$50,000, 2005. Knutson & Crowley.
23. Children's Museum of Pittsburgh, Developing web games to facilitate home-museum synergy, \$51,083, 2004-2006. [Subcontract to Crowley from a larger IMLS award to the museum.]

22. Carnegie Mellon University, Learning about Mars, Autonomous Robots, and the Nature of Life: Studies of the Personal Exploration Rover Exhibit, \$10,000, 2004-2005. (Subcontract to Crowley from a NASA award to CMU).
21. Setting Priorities for the Retirement Years (SPRY), Intergenerational learning with older adults and children in museums, on the web, and in programs, \$85,000, 2004-2005. A subcontract to Crowley & Knutson from an NSF grant to SPRY.
20. The Andy Warhol Museum, Research on Re-Installing the Permanent Collection and Teen Programs, \$12,000, 2004. Knutson & Crowley.
19. Setting Priorities for the Retirement Years (SPRY), Evaluation of organizational aspects of the Science Across the Generations Project, \$8500, 2004-2005. Knutson & Crowley.
18. Carnegie Museum of Natural History, Expertise and museum learning: Studies of learning in Dinosaur Hall. 2004, \$20,000.
17. The Tech Museum of Innovation, Learning with TechTags, \$15,000, 2004. Eberbach & Crowley
16. Heinz Endowments, Creating a Place for Family Learning: The Transformation of a Children's Museum, \$303,000, 2003-2006. Crowley & Knutson.
15. National Wildlife Federation, Review of Botanical Reasoning Strategies, \$5000, 2003. Eberbach & Crowley.
14. Children's Museum Pittsburgh, Family learning on the web, \$11,000, 2003-2004.
13. National Science Foundation, Conceptualizing and Assessing Web-based Informal Science Learning, \$665,615, 2002-2005. Crowley (PI); Leinhardt (Co-PI).
12. National Science Foundation, Explanatoids: Gender-Sensitive Signage to Seed Science Talk in Public Places, \$900,000, 2002-2005. Stocks (PI), Crowley (Co-PI), Hughes (Co-PI).
11. Heinz Endowments and the Pittsburgh Children's Museum, Documenting Culture and Practice in a Children's Museum, \$24,500, 2002-2003. Crowley & Knutson.
10. Family Communications, Professional development learning in a train-the-trainers workshop, \$40,000, 2002-2003. Crowley & Blessing.
09. University of Pittsburgh Central Research Development Fund, Robot City: What children learn about artificial and human intelligence from interacting with autonomous mobile robots, \$15,486, 2000 to 2002. Crowley.
08. Heinz Endowments, Explanatoids: Signage to Seed Science Talk in Pittsburgh's Public Places, \$50,000, 2001-2002, Stubbs, Stocks, Crowley, & Vogel.
07. National Science Foundation, Responding to the Gender Gap in Informal Science Education, ESI-9815021, \$585,548, 1999-2003. Crowley (PI).
06. Pittsburgh Children's Museum, Facilitating Parent Support of Young Children's Learning in a Children's Museum, \$4,000, 1999.
05. U.S. Department of Agriculture, Learning to teach science by doing science: The educational consequences of teacher participation in a botanical field survey, 58-3148-8-096, \$47,643, 1998-2000. Crowley.
04. Institute for Museum and Library Services, National Science Foundation, National Endowment for the Arts, National Endowment for the Humanities, The Museum Learning Collaborative \$1,000,000 (1997-2003). Leinhardt, Crowley, & Schauble.
03. Children's Discovery Museum of San Jose, Parent-child scientific thinking: Studies of family learning at the "Take Another Look" interactive science exhibition \$31,000, 1995-1997.
02. Mitsubishi Bank Foundation, Multidisciplinary Collaboration in Cognitive Science, \$54,000, 1994-1998. Okada, Crowley, Schunn.
01. Sato Toy & Culture Foundation, A Developmental Study of Children's Scientific Thinking, \$4,000. Okada, Crowley.