

CITIZEN SCIENCE

Publications from the [MSPNet](#) Library

1. "Engagement in Science Through Citizen Science: Moving Beyond Data Collection," Tina B. Phillips, Heidi L. Ballard, Bruce V. Lewenstein, Rick Bonney, Science Education, February 2019.

"To date, most studies of citizen science engagement focus on quantifiable measures related to the contribution of data or other output measures. Few studies have attempted to qualitatively characterize citizen science engagement across multiple projects and from the perspective of the participants. Building on pertinent literature and sociocultural learning theories, this study operationalizes engagement in citizen science through an analysis of interviews of 72 participants from six different environmentally based projects. We document engagement in citizen science through an examination of cognitive, affective, social, behavioral, and motivational dimensions. We assert that engagement in citizen science is enhanced by acknowledging these multiple dimensions and creating opportunities for volunteers to find personal relevance in their work with scientists. A Dimensions of Engagement framework is presented that can facilitate the innovation of new questions and methodologies for studying engagement in citizen science and other forms of informal science education."

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<http://hub.mspnet.org/index.cfm/33772>

2. "A Framework for Articulating and Measuring Individual Learning Outcomes from Participation in Citizen Science," Tina Phillips, Norman Porticella, Mark Constas, Rick Bonney, Citizen Science: Theory and Practice, August 2018.

"Since first being introduced in the mid 1990s, the term "citizen science"-the intentional engagement of the public in scientific research-has seen phenomenal growth as measured by the number of projects developed, people involved, and articles published. In addition to contributing to scientific knowledge, many citizen science projects attempt to achieve learning outcomes among their participants, however, little guidance is available for practitioners regarding the types of learning that can be supported through citizen science or the measuring of learning outcomes. This study provides empirical data to understand how intended learning outcomes first described by the informal science education field have been employed and measured within the citizen science field. We also present a framework for describing learning outcomes that should help citizen science practitioners, researchers, and evaluators in designing projects and in studying and evaluating their impacts. This is a first step in building evaluation capacity across the field of citizen science."

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3. "Do Children Make Good Citizen Scientists? Learning Outcomes and Scientific Accuracy in an Afterschool Citizen Science Educational Program," Christine L. Goforth, Connected Science Learning, August 2018.

"Given the challenges teachers face when implementing citizen science in the classroom, the opportunity exists for informal science education organizations, such as museums, science centers, and environmental education centers, to offer these experiences to K-12 students during out-of-school time (Bonney et al. 2009). If thoughtfully designed, such programs can augment science learning in formal education settings and help prepare students to become, if not scientists themselves, scientifically literate adults who understand the process of science sufficiently to make informed decisions."

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4. "Turning Students into Citizen Scientists," John Harlin, Laure Kloetzer, Dan Patton, Chris Leonhard, Citizen Science: Innovation in Open Science, Society and Policy, October 2018.

"As citizen science grows in popularity, most of the attention focuses on adult volunteers and their potential contribution to science and society. But what about all the millions of children studying science in school as they learn the skills of citizenship? Would hands-on involvement in real science projects simultaneously teach them about the scientific process and make them feel more engaged with the world they'll soon inherit? Could these budding scientists contribute actual data and knowledge that adds value to science and society? From our experience in education, the answers seem to be a resounding "yes". This chapter explores citizen science in schools. We'll highlight key learnings from the scientific literature, then we'll explore the case study of a large teacher-developed citizen science project at the Leysin American School in Switzerland called LETS, for *Local Environmental Transect Survey*. We'll hear from students who've participated in the LETS project. We'll also examine how citizen science can be integrated into teaching, sharing some of the ideas generated by the session "Embedding Citizen Science Into Schools" held at the 2016 ECSA conference in Berlin."

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<http://hub.mspnet.org/index.cfm/33775>

5. "Citizen Science and Children," Karen E. Makuch, Miriam R. Aczel, Citizen Science: Innovation in Open Science, Society and Policy, October 2018.

"To date, a cursory examination of the literature tells us that a large number of citizen science projects have been, or are, in the environmental domain. It is thus on

environmental citizen science that we focus this work. This chapter suggests why children ought to be involved in citizen science -- largely through environmental projects, highlights some case study examples to show positive and negative outcomes of child participation in said projects, comments on the potential contributions to science education and environmental awareness, and highlights some practical considerations of child involvement in citizen science."

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