

Addressing Climate Change Through Education

Tamara Shapiro Ledley, Juliette Rooney-Varga, and Frank Niepold

— *Oxford University Press Encyclopedia of Environmental Science*, June 2017

Summary

The scientific community has made the urgent need to mitigate climate change clear and, with the ratification of the Paris Agreement under the United Nations Framework Convention on Climate Change, the international community has formally accepted ambitious mitigation goals. However, a wide gap remains between the aspirational emissions reduction goals of the Paris Agreement and the real-world pledges and actions of nations that are party to it. Closing that emissions gap can only be achieved if a similarly wide gap between scientific and societal understanding of climate change is also closed.

Several fundamental aspects of climate change make clear both the need for education and the opportunity it offers. First, addressing climate change will require action at all levels of society, including individuals, organizations, businesses, local, state, and national governments, and international bodies. It cannot be addressed by a few individuals with privileged access to information, but rather requires transfer of knowledge, both intellectually and affectively, to decision-makers and their constituents at all levels. Second, education is needed because, in the case of climate change, learning from experience is learning too late. The delay between decisions that cause climate change and their full societal impact can range from decades to millennia. As a result, learning from education, rather than experience, is necessary to avoid those impacts.

Climate change and sustainability represent complex, dynamic systems that demand a systems thinking approach. Systems thinking takes a holistic, long-term perspective that focuses on relationships between interacting parts, and how those relationships generate behavior over time. System dynamics includes formal mapping and modeling of systems, to improve understanding of the behavior of complex systems as well as how they respond to human or other interventions. Systems approaches are increasingly seen as critical to climate change education, as the human and natural systems involved in climate change epitomize a complex, dynamic problem that crosses disciplines and societal sectors.

A systems thinking approach can also be used to examine the potential for education to serve as a vehicle for societal change. In particular, education can enable society to benefit from climate change science by transferring scientific knowledge across societal sectors. Education plays a central role in several processes that can accelerate social change and climate change mitigation. Effective climate change education increases the number of informed and engaged citizens, building social will or pressure to shape policy, and building a workforce for a low-carbon economy. Indeed, several climate change education efforts to date have delivered gains in climate and energy knowledge, affect, and/or motivation. However, society still faces challenges in coordinating initiatives across audiences, managing and leveraging resources, and making effective investments at a scale that is commensurate with the climate change challenge. Education is needed to promote informed decision-making at all levels of society.

[Read article.](#)