From Anecdotes to Evidence: Demonstrating the Power of Environmental Education

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KEY STRATEGIES

Environmental Education Strategies That Support Conservation Results

Researchers at Stanford University analyzed 105 peer-reviewed studies to assess environmental education's effects on conservation outcomes.

The findings suggest that environmental education helps grow and sustain a range of conservation efforts, including community conservation work, where it helps people understand, care about, and act on environmental issues. Refer to the executive summary for more on five key ways **environmental education contributes to conservation and environmental quality.**

The Stanford team conducted an additional analysis to identify just what kinds of environmental education strategies and programs were most effective. The analysis found that studies reporting positive conservation outcomes shared common characteristics: 1) choose topics with a **local focus,** 2) **form partnerships** with scientists and resource managers from local agencies and organizations, 3) **incorporate action projects** aimed at solving at least part of a problem, and 4) be creative and thorough in **measuring and reporting program outcomes.**

STRATEGY 1

Focus on local environmental issues or locally relevant elements of broader environmental issues.

Successful environmental education programs often keep a community focus, using local environments (such as parks, nature reserves, urban green spaces, or schoolyards) to connect people with broader environmental issues and engage them in learning and action.

These programs often start with conversations with community members that identify and investigate issues and work collaboratively toward solutions. Many of these programs also include scientists who teach community members to collect data, monitor outcomes, and partner with the government to reach conservation goals.

"Environmental education fosters [students'] connection to their environment and creates vibrant partnerships between schools and communities. . . . [It] helps students learn to take care of the world by understanding where they live and taking action in their own backyards and communities."[1]

– Place-Based Education Evaluation Collaborative

- In a reforestation project in Mexico, students created nurseries, learned how to help care for the land, [served as local land stewards], and participated in plantings on school grounds and other deforested parts of the community.[2]
- Dairy farmers in New Zealand learned about pollution problems affecting their community's shellfish industry and reduced the pollution of local waterways from livestock grazing.[3]
- Environmental education programs on several Western Indian Ocean islands focused on conserving local endangered fruit bats to show that the threats facing the bats were similar to those facing wildlife globally.[4]

"Thank you so much for letting Ottawa school come to Thunder Bay [National Marine Sanctuary]. I loved it. I learned so much about the Great Lakes. . . . When I grow up, I want to be just like you."

– Fourth grade participant in the National Oceanic Atmospheric Administration's Every Kid in a Park program

These are just a few examples of how environmental education programs are contributing to conservation outcomes. Successful programs not only engage participants in taking environmental actions in their community; they also lead to continuing participation in local environmental efforts.

STRATEGY 2

Form partnerships with scientists and resource managers from local agencies and organizations.

Many environmental education programs that are working to achieve conservation outcomes involve partnerships. Mutually beneficial partnerships can include schools, community groups, scientific organizations, businesses, nonprofit organizations, and government agencies. By connecting with other organizations and experts, successful environmental education programs build collaborations that more effectively address complex environmental problems than any one entity working alone.

Several studies in Stanford's review highlight environmental education programs that established or strengthened connections with their surrounding communities, such as a school-based program contributing to a community-wide effort to address an environmental problem. Other studies report partnerships that help deliver conservation messages to broader audiences by providing information to partner networks, including the local media, nonprofit organizations, and government agencies.

- Five environmental education programs in the United States invited incarcerated individuals to work with scientists and natural area managers to support ecological research and habitat restoration. The five programs trained more than 100 inmates to raise and release into the wild approximately 1,000,000 native plants, 550 frogs, and 4,000 butterflies.[5]
- A university course was held in partnership with a watershed organization to engage students in monitoring stream health, sharing data with researchers, and organizing outreach activities. Through this process, students increased the community's knowledge about the watershed's health and improved the watershed. Staff members from the collaborating organization helped ensure that the students were accurately monitoring water quality and recording and distributing the results.[6]

- Researchers developed a partnership with scientists, natural resource managers, and university students to address biodiversity loss in Newcastle, Australia. Blending education, research, and action, the partners cleared a large, ecologically important patch of land in a natural reserve and then replanted the area with native species. The rehabilitation effort increased conservation knowledge and skills as well as monitoring and regeneration activities, with very positive conservation results.[7]

STRATEGY 3

Incorporate action elements into programs.

Environmental education programs focused on achieving conservation results often involve at least one opportunity for participants to take action. In terms of linking education and conservation results, the most successful programs deliberately use action-oriented learning strategies and approaches, including citizen science and service-learning. They also use hands-on activities such as removing invasive plant species, organizing litter cleanups, and installing water quality improvement systems explicitly to tackle local environmental challenges and make immediate improvements to degraded land, water, air, and species. Other action components range from motivating and supporting inquiries into local environmental problems to sharing ecological monitoring data with scientists and community partners.

- A project-based university course in Australia included class lectures complemented by fieldwork to restore degraded habitat. While improving restoration sites, students increased their knowledge of local ecosystems and improved their skills in evaluating plant species. Their work included clearing litter and weeds from a large, ecologically important patch of habitat and planting the site with native seedlings.[8]
- University students in Mexico researched sea turtle habitat and submitted a proposal to the Mexican government for a marine protected area, with separate zones for fishing and ecotourism.[9]
- In East Africa, residents and scientists collaborated in monitoring critically endangered bats and their habitat. This brought pressure on the local government to pass laws protecting the bats and their habitat, which eventually led to the establishment of a forest reserve.[10]

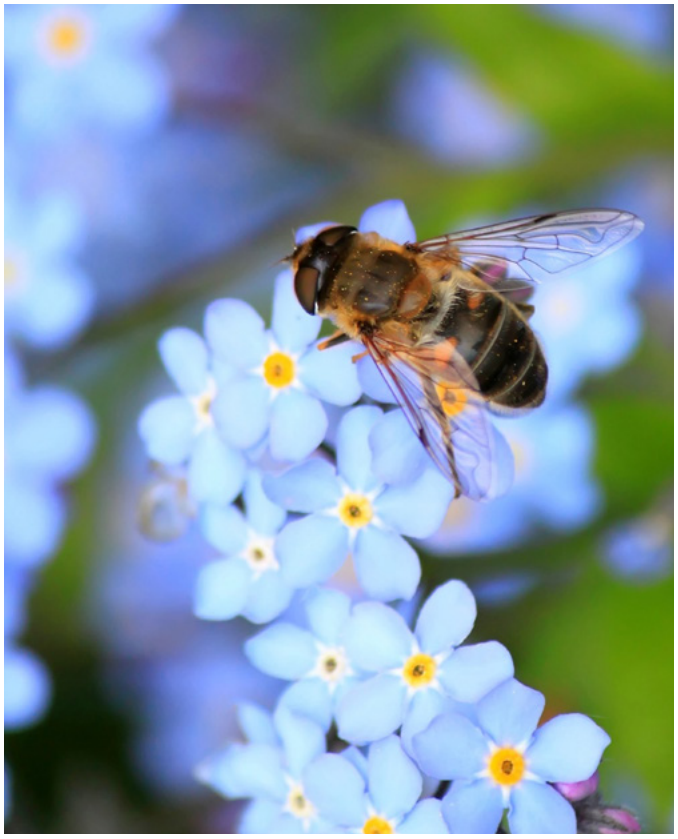
Whether program-embedded action projects involve directly improving the physical environment, supporting policies, or engaging communities, taking action as an embedded element of environmental education programming creates opportunities to make direct conservation impacts.

STRATEGY 4

Be creative in designing programs focused on conservation goals and thoroughly measuring and reporting outcomes.

To successfully reach conservation goals, environmental education programs must plan to identify and measure conservation outcomes, such as the amount of trash removed, number of trees planted, or acres restored. Researchers describe evaluation as a critical part of program development in several studies, with measuring conservation results as a top priority. Additionally, by creatively planning programs with specific conservation outcomes in mind, successful programs often incorporate vital strategies shown to be effective for achieving conservation impacts: making local connections, forming partnerships, and integrating action projects. Programs were often designed using principles from educational or behavioral science theories and frameworks to link education program goals with environmental and conservation goals. Educators used approaches based on what learning and behavioral sciences tell us are hallmarks of effective educational experiences: integrating hands-on activities for the students, developing and practicing action skills, and helping learners feel empowered and capable of achieving environmental goals.

- Programs that included the evaluation of conservation results into their design often reported specific outcomes, such as the number of trees planted and their survival rates.[11]
- Designing effective evaluation strategies also helped program developers report on outcomes that can be more challenging to quantify, such as increasing the capacity of individuals and organizations to tackle conservation issues and building stronger connections in the community.[12]



Conclusion

Environmental education uses proven strategies to help individuals and communities understand environmental challenges and increase their participation in addressing them. It also builds the skills needed to create change. Involvement in conservation programs fosters success by focusing efforts on local issues, engaging partners with resources and expertise, encouraging direct action, and linking program goals to broader conservation initiatives.

To learn more about designing environmental education programs for conservation outcomes, including building effective partnerships and community capacity, please refer to the ***Toolkit for Engaging People in Conservation***, ***Guidelines for Excellence: Community Engagement***, and ***Conservation Education and Outreach Techniques***. For more information on environmental education program evaluation and strategies for measuring program outcomes, please visit NAAEE's online **database**, research and evaluation **learning module**, and environmental education program evaluation **workbook for practitioners**.

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