Education for strategic environmental behavior

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This article reviews four bodies of research that shed light on how to promote active care for the environment in children and youth: research on sources of proenvironmental behavior, socialization for democratic skills and values, the development of a personal sense of competence, and the development of collective competence. The article begins with an overview of studies of formative childhood experiences reported by environmental activists and educators, followed by correlational and experimental studies with young people regarding factors associated with their taking action for the environment. Because behaviors with the largest potential benefits for the environment require political engagement, the article also reviews experiences associated with young people's interest and engagement in public issues. Action for the environment in the home or in public arena like schools and communities requires a personal sense of competence and a sense of collective competence, or confidence in one's ability to achieve goals by working with a group. Therefore experiences that promote the development of these assets are summarized as well. The conclusion compares major findings in these different fields and discusses implications for environmental educators.

From private to public sphere environmentalism

According to the Tbilisi Declaration, the ultimate objective of environmental education is people's active involvement in working toward the resolution of environmental problems (Intergovernmental Conference on Environmental Education 1977). Other objectives are ingredients needed to achieve this goal: awareness, knowledge, concern for the environment, and skills. In a much cited article, Hungerford and Volk (1990) noted that environmental educators typically assume that if they simply impart knowledge to students, responsible action will follow. Research, however, indicates that the antecedents of action are much more complex than knowledge alone. This article is a synthesis of research that casts light on the conditions that encourage proenvironmental action by young people.

Before embarking on this investigation, a fundamental preliminary question needs to be raised: "What kinds of actions most effectively address environmental problems?" It is not enough for environmental education to promote action for the environment: It needs to emphasize the most strategic actions. This issue has been raised by Stern (2000), who distinguishes 'private sphere' and 'public sphere' environmentalism. Measures of responsible environmental behavior in environmental education research have typically focused on private actions, such as turning off unneeded lights, recycling, composting, green purchasing, or reading about environmental issues (e.g. Inventory of Responsible Environmental Behavior by Sia 1984; inventory of pro-environmental behaviors by Palmer & Suggate 1996). Similar behavior changes form the goal of many environmental initiatives in schools. Solutions to environmental problems must be multifaceted, and these actions certainly have their place. An analysis of the world's most serious environmental problems, however, suggests that the effect of private actions is limited unless it is

combined with organizing for collective public change. If environmental educators confine themselves to fostering private sphere environmentalism, they may in fact be leading students astray.

Take the example of the United States, the worst offender among the world's nations in terms of per capita consumption of energy and natural resources. Individual energy use accounts for only one-third of the country's total energy consumption, while the rest is consumed by business, industry, and big institutions like government (Gardner & Stern 2002, p. 258). If we analyze sources of pollution or solid waste, we find the same disproportion between the contributions of individuals versus big actors. As a consequence, Gardner and Stern (2002) argue that although private actions for the environment are important, the most effective actions are collective, when people organize to pressure government and industry to act for the common good. Within the private sphere, people should make similar strategic decisions, as some choices have larger impacts on the environment than others. Lowering the thermostat in winter, for example, saves much more energy than turning off unneeded lights.

Admittedly, in the preschool and elementary school years, small-scale actions at the level of the classroom, the school yard and the local environment are most appropriate. Young children should not be burdened with distant environmental problems and the operations of distant institutions beyond their levels of direct experience and comprehension (Sobel 1996). By the middle-school and secondary-school years in the United States and most other advanced economies, however, students are expected to learn how government works and how citizens can play an active role. Therefore this article reviews four bodies of research relevant to the question, 'How can environmental education promote not simply action for the environment, but the most strategically effective action, which includes collective political action?'

We begin with research on sources of responsible environmental behavior, and then compare findings in this field with research on political socialization and the development of active citizenship. Because people are more likely to get engaged politically if they have a personal sense of competence *and* a belief in their collective competence (their ability to achieve goals working together with a group), we examine research in these fields as well. Our goal is two-fold: to identify overlapping conclusions among these different fields of research which suggest fundamental processes in the development of effective action; and to note dimensions of action neglected by environmental education research but illuminated by other fields

Antecedents of action for the environment

In their review of factors that contribute to responsible environmental behavior, Hungerford and Volk (1990) distinguished "entry-level variables" that predispose people to take an interest in the environment, "ownership variables" such as a personal investment in certain environmental issues and making oneself knowledgeable about them, and "empowerment variables" that include skill in using environmental action strategies and the belief that one can be successful. A parallel can be drawn between these conclusions and the more recent value-belief-norm theory summarized by Stern (2000). According to this theory, people need to value the protection of the environment for its own sake or because they understand its benefits for human society (values that can be categorized as entry-level variables). They also need to know enough about environmental issues to understand consequences for themselves and the people and places that

matter to them (taking ownership of issues). Finally, they need to believe that they can have an effect on these issues and that social norms prescribe that they should act (empowerment).

Gardner and Stern (2002) have noted that whether or not people take action in line with their values and concerns depends to a large degree on the scale of the barriers that they face in terms of the time and resources that action will cost. Many barriers are structural, or built into the fabric of everyday life through government regulations, business practices, or the physical form of human settlements. This is another reason why people often need to take collective political action in order to dismantle barriers to more sustainable lifestyles.

These models of Stern (2000) and Hungerford and Volk (1990) are based on meta-analyses of hundreds of empirical studies, but almost all of these studies have been carried out with adult samples. Given their large research base, these models are useful guides for how to foster action for the environment, but before they can be followed by environmental educators, they need to be compared with the smaller but still substantial base of research that focuses on young people's development. There have been three windows into young people's environmental behavior. One is retrospective, composed of research on the "significant life experiences" of adults and youth who have demonstrated their commitment to environmental protection or education. Another consists of surveys which correlate young people's stated intention to take action for the environment or self-reported action with other factors in their lives. A third body of studies has used experimental and quasi-experimental designs to compare behavioral outcomes from different types of environmental programs.

Most research on the formative experiences of environmental activists and educators are simple descriptive studies, based on interviews or surveys which have asked people the sources of their environmental interest, concern or action. The power of this research is that it now involves diverse samples from around the world, and despite differences in nationality and profession, people in North America, Central America, Europe, Africa and Australia give similar answers (see review by Chawla 1998; also Chawla 1999; Palmer & Suggate 1998; Palmer et al. 1998, 1999; Sward 1999). These answers coincide with the childhood experiences that distinguish environmentally active respondents from those who show less commitment, according to large surveys (Sia, Hungerford & Tomera 1985/1986; Sivek & Hungerford 1989/90; Wells & Lekies 2006; Finger 1993, 1994). In an interview study in Wisconsin (Sivek 2002) and a large survey in Germany (Bögeholz 1999, cited in Bögeholz 2006), secondary school students who were active in environmental clubs already reported similar formative experiences.

In these studies, from half to more than 80% of the respondents identify childhood experiences of nature as a significant experience, such as free play, hiking, camping, fishing and berry picking. They mention influential family members or other role models equally often or second in importance. As one would expect, environmental educators often attribute their vocation to influential teachers and education. Other common answers are experiences in organizations like the Scouts or environmental groups, witnessing the destruction or pollution of a valued place, and reading books about nature and the environment. This research has been criticized, primarily because it looks backwards to distant childhood experiences rather than focusing on contemporary conditions for young people (Scott, 1999). No conflicting evidence has been presented, however, and the fact that similar formative experiences are identified by descriptive qualitative studies and large correlational surveys, in a variety of cultures, by secondary school students as well as older populations, gives these findings weight.

These findings suggest that nature activities in childhood and youth, as well as examples of parents, teachers and other role models who show an interest in nature, are key "entry-level variables" that predispose people to take an interest in nature themselves and later work for its protection. Education programs and membership in environmental clubs and organizations can be seen as arena to gain increased knowledge about environmental issues and learn environmental action skills ("ownership" and "empowerment" variables). These antecedents of action are exactly what developmental theory in the field of ecological psychology would predict (Chawla, forthcoming).

Another body of relevant research relates what children and youth say they have done for the environment to other variables, such as levels of environmental knowledge. It needs to be read with the caution that it relies on young people's self-reported behavior or stated intention to act, rather than observed evidence of their action. Another concern is that the behavior surveys used in these studies emphasize 'private sphere' environmentalism such as recycling, not littering, and buying products with less packaging, to the virtual exclusion of public forms of involvement such as membership in environmental organizations or political letter writing (see review in Rickinson 2001, pp. 258-262). Nevertheless, this research has found that three factors frequently predict self-reported action or the intention to take action for the environment: gender, socioeconomic status, and environmental attitudes and knowledge. Girls report more proenvironmental behavior than boys (Rickinson 2001, p. 261; Zelezny 1999). Young people in disadvantaged communities have been more likely to report conservation behaviors that save or earn money (Kahn & Friedman 1995; Roper Starch Worldwide 1994). Students with greater knowledge about the environment or more proenvironmental attitudes are more likely to report action for the environment (Kuhlemeier et al. 1999; Roper Starch Worldwide 1994; Meinhold & Markus 2005).

Environmental educators cannot change students' gender or socioeconomic status—though they can seek to understand differences between girls' and boys' behaviors and the environmental behaviors that matter most to students from different backgrounds. What educators *can* influence are students' opportunities to gain knowledge, form positive attitudes about the environment, and practice action skills. Most relevant in this respect, a few quasi-experimental designs have evaluated the outcomes of environmental programs in schools, after-school programs and nature centers, measured in terms of young people's increased environmental concern and action. These studies indicate that the most effective programs embody the following characteristics: an extended duration of time, opportunities to learn and practice action skills, and success in achieving some valued goals.

Extended programs are more likely to lead to change—especially behavior change (see reviews in Rickinson 2001, pp. 270-271; Rickinson et al. 2004; Zelezny 1999). Most programs that show gains in young people's reported environmental behaviors or their stated intention to protect the environment also include an action component, such as writing letters to advocate wildlife protection, making nesting boxes for birds, carrying out energy conservation activities, or initiating community projects that investigate local environmental issues and implement ways to address problems (Bogner 1999; Culen 1994; Hanson 1993; Jordan et al. 1986). It is critical, however, for young people to see that their efforts are taken seriously by others and that they are able to realize at least some of their ideas. Research by Bull (1992) in two Detroit middle schools serves as a caution in this respect. The middle-school students were involved in an "Action

Research and Community Problem-solving" curriculum, but they lacked clearly defined roles for decision-making and failed to achieve some of their main goals. Under these conditions, outcome measures showed a decline in their feelings of empowerment related to their ability to solve some environmental problems.

Antecedents of political action

The most effective action for the environment is collective political engagement because it is the force that moves major actors like business and government, from local to national and even international levels, to take responsibility for the environment and to dismantle barriers to action in private life. People cannot purchase energy efficient cars, use public transportation or travel on bikeways, for example, unless business and government make these choices available. Therefore the literature on young people's political socialization and civic action is highly relevant to environmental education. This section discusses the conditions that foster young people's interest and engagement in public issues, their understanding and appreciation of democratic values and principles, and their knowledge of political processes. (For a comparison of key findings in each body of research, see Table 1.)

[Place Table 1 around here.]

This research begins with early childhood, a period of life that has been largely neglected by environmental education research. Baumrind (1971) found that an authoritative parenting style, combining high standards for behavior and clear rules with encouragement for children to express their thoughts and feelings, is associated with high levels of social responsibility in children. Dekovic and Janssens (1992) have termed this type of parenting "democratic," in recognition that its combination of high standards for social responsibility along with a respect for children's voice and perspective reflects core democratic principles.

Children also need opportunities for collaborative decision-making in everyday life, from early childhood on, in settings including the home, school, day care, after-school activities, and youth clubs and organizations. These opportunities enable young people to exercise control of their environment and other elements of their lives—another core principle of democracy. Flekkøy and Kaufman (1997) argue that through these means young people gain autonomy, a sense of self-worth, respect for other people's perspectives, and negotiation skills. This idea corresponds with the philosophy of John Dewey (1916), who also believed that democracy needs to be practiced in various arena of life, and that the democracy of a government is only as good as its embodiment in everyday life.

Parents and other family members are critical role models of interest in public issues as well as prosocial values. In a comparison of adolescents in seven nations, young people were most likely to say that helping their country and doing something to improve their society were important life goals if they also reported that their families emphasized an ethic of social justice (Flanagan et al. 1998). This association was found even though young respondents' most frequent form of civic engagement was working to protect the environment. Children are more likely to participate in community activities if their parents are also active in this way, or give them approval and encouragement to take part (Fletcher et al. 2000; Pancer & Pratt 1999). These findings indicate that it is important for teachers to reach out to parents, communicating the

importance of democratic parenting, highlighting student contributions, and enlisting parents' support and involvement when classes do community projects.

Teachers play a critical direct role in political socialization by creating opportunities for the open discussion of public issues in the classroom. This in itself is a primary factor associated with students' political interest and activity and sense of political efficacy (see review in Hahn 1998, pp. 179-181; Niemi & Junn 1998). Discussions within supportive environments enable children and youth to consider a range of perspectives, integrate what they hear and transform it into their own words, and think through their own positions.

Public issues gain personal meaning when young people confront social inequities and environmental problems in their communities through experiences like service in homeless shelters or environmental clean-ups. Participation in school councils, youth boards, mock elections and activities like the Model United Nations can also bring issues to life. Through these opportunities, young people say that they become more confident, develop skills like public speaking, learn to work with people and accept them as they are, and exercise leadership (Pancer & Pratt 1999; Roker et al. 1999). A number of studies have shown that participation in these types of activities in childhood and adolescence is associated with higher rates of community service, political volunteering, voting and attending political rallies in later adolescence and adulthood (Glanville 1999; Reinders & Youniss 2006; Rosenthal et al. 1998; Verba et al. 1995). These prosocial experiences of relatedness and agency are the means through which young people develop a lasting sense of civic identity (Yates & Youniss 1999).

Leading researchers in the field of political socialization have concluded that the most effective way for children and youth to learn about government and politics and practice active citizenship is to engage with public issues at the local level, where they can see democratic processes in action and the effects of their contributions (Conover & Searing 1994; Niemi & Junn 1998; Torney Purta et al.1999). Notably, this conclusion has also been advanced by Jensen and Schnack (1997) in environmental education. The potential power of engaging young people in local government is indicated by the evaluation of two models for integrating youth into city planning. Thirty years after a Pennsylvania high school teacher involved his senior students in assisting the City Planning Commission in preparing a master plan for anticipated growth, Beane and colleagues (1981) tracked down graduates of this class and compared them with other school alumnae who happened to be placed in conventional classes but who were otherwise similar. Over the intervening years, members of the planning project were four times more likely than non-members to have belonged to volunteer groups and twice as likely to have been officers in civic and service organizations. In Hampton, Virginia, the City Council created paid part-time positions for two high school students to conduct regular surveys and focus group discussions with their peers about issues of concern, keep other young people informed about opportunities for community engagement, and facilitate a Youth Commission. After these activities were initiated, the voting rate of eligible young adult voters in the city climbed, exceeding the national average by 29% in the 2004 election (Carlson 2005).

A sense of competence—a foundation for action

Masten and Coatsworth (1998) define competence as "reasonable success with major developmental tasks expected for a person of a given age and gender in the context of his or her culture, society, and time" (p. 206). A sense of competence, or sense of self-efficacy, consists of

the belief that one can achieve success in areas of personal significance—such as these social expectations. Beyond the actual display of competence, a sense of competence is critical for healthy development because it contributes to a sense of self-worth and the resolve necessary to set and reach challenging goals (Bandura 1997). Therefore it is an ingredient in the "empowerment variables" identified by Hungerford and Volk (1990) and in the belief that one can have an impact on environmental issues, which Stern (2000) discusses. An investigation of the relationship between environmental attitudes, behavior and a sense of self-efficacy suggests that these connections deserve more attention (Meinhold & Malkus 2005; see discussion by Berman 1997, pp.41-48).

A related asset is "initiative," which according to Larson (2000) can be inferred when people voluntarily choose to invest themselves in an activity and devote constructive attention and effort over time to achieve their goal. A sense of competence gives people confidence that their investment of effort over time will yield results. A key feature of the definition of both a sense of competence and initiative is that pursuits are personally significant. Reaching the chosen goal *matters* to a person. For environmental projects, this means that young people need to play a central role in setting goals themselves.

The following sections review the development of both an individual and collective sense of competence, as confidence that one can achieve goals oneself and confidence in achieving goals as a group are mutually reinforcing. People are more likely to contribute to a group when they have confidence in themselves and their capabilities, while at the same time, individuals are more likely to feel self-confident when they are surrounded by a strong, supportive group.

An individual sense of competence

A common theme throughout the bodies of research reviewed for this paper is the importance of role models. (See Table 1.) Research on the development of an individual sense of competence indicates that role models enable young people to observe the success of others, see the processes other people use to achieve their goals, and then assess their own competence in comparison (Bandura 1982; Schunk et al. 1987). When the behavior produces positive outcomes and the environment is supportive, children are likely to imitate the successful action. By observing others, children learn about the demands and difficulties of a task, effective coping strategies, and potential outcomes. This is especially true for peer models where the model is similar in age and developmental stage, creating a situation where the model's success or failure convincingly predicts the child's own probable performance. When people are unsure about their own abilities, this vicarious information becomes a particularly valuable source of reassurance (Takata and Takata, 1976). Other factors that contribute to the development of a sense of competence are the verbal encouragement of others, learning to interpret feelings like stress or tiredness as normal signs of exertion rather than weakness--and most important of all, mastery experiences when one tastes success oneself (Bandura 1997).

Bandura (1986) has combined these contributing factors into a program for "mastery modeling" which has been applied in a variety of fields and which is relevant to learning action skills in environmental education. Beginning with *instructive modeling*, complex skills are divided into manageable subskills of graduated difficulty and role models demonstrate these skills while they verbalize the knowledge, attitudes and strategies needed for success. The next step includes *guided practice* where children gain experience using these skills and testing them out for

themselves. The final step is *transfer training*, in which children learn how to apply their new knowledge and experience in increasingly difficult situations. Within this program, children are given the opportunities to master skills and experience success in progressively complex situations.

This program has been widely used to facilitate people's accomplishment of fixed skills which allow little or no variation, as in learning mathematics, but it is also relevant to the acquisition of 'generative skills' which must be flexibly adapted to changing situations (Bandura, 1997, p. 440). Environmental problem-solving requires generative skills. Because environmental projects in communities often depend on the cooperation of many stakeholders and therefore the outcome is uncertain, it is particularly important to break distant goals down into a series of subgoals over which teachers, students and their families' have more control, so that students are assured the chance to experience a series of successes. Environmental club members who advocate greening their whole school yard, for example, may begin by planting a garden in one corner. Mastery modeling also points to the importance of talking through processes of overcoming challenges and finding strategies for success.

A sense of collective competence

Left to themselves, young people can easily feel disempowered by the scale of environmental problems. They need opportunities to work for social and environmental change with others in order to acquire a collective sense of competence, or the belief held by members of a group that they can coordinate their actions effectively and accomplish shared goals through unified efforts (Bandura 1997). Because effective groups depend on strong members, and political action is a form of collective action, factors that have already been associated with political interest and engagement and a sense of individual competence are also critical for a sense of collective competence.

When members of a student group or youth organization are strong, young people find themselves surrounded by role models of the most persuasive kind: their peers whose accomplishments are likely to predict their own capabilities (Bandura 1982; Schunk et al. 1987). Peer activities are only likely to be motivating, however, if a group achieves a level of success that boost members' confidence and morale. Therefore it is critical for environmental educators to help groups judge what they can accomplish with the time and resources available. In this respect, the process of mastery modeling, which includes breaking distant goals down into a series of manageable subgoals, is all the more important (Bandura 1986).

Discussion is the lifeblood of group dynamics. Group members need time to discuss issues and ideas as they decide the priorities that they will commit themselves to. As the research on political socialization has shown, this type of discussion in itself is associated with political interest and activity (Hahn 1998; Niemi & Junn 1998). Group members also need to plan the most effective strategies to achieve their goals and surmount challenges. This type of discussion is another component of mastery modeling (Bandura 1986). Finally, it is critical for the members of a group to learn how to resolve conflicts, which is associated with individual moral development as well as group benefits (Haan et al. 1985). Groups establish the cooperation essential for success by talking through issues, reaching consensus about goals, showing consideration for different members' opinions and ideas, and being willing to compromise and

negotiate conflict: all ends achieved through the means of group discussion. In the process, members come together around goals of shared significance.

Exchanges and gatherings between young people's groups, where they can share similar experiences, action strategies, and success stories, as well as build friendships, can be inspirational and motivating experiences. Young people often identify the friendships that they forge in their group and opportunities to have fun together as intrinsic rewards of participation, along with the satisfaction of seeing that they can make a difference (Pancer & Pratt 1999). Mutual support and friendship need to be recognized as not just means to effective group functioning, but from a young person's perspective, valued ends in themselves.

These steps for building individual and collective competence, as well as practicing democratic skills and values, can be illustrated by a network of six New York sites in UNESCO's Growing Up in Cities program (Chawla and Driskell, in press). Created as partnerships between Cornell University, public schools and community organizations in low-income districts of the city, the initiative offers summer programs that engage young adolescents in planning and implementing ways to improve their local environments. After documenting their neighborhoods through walking tours, photography, mapping and interviews, participants discuss priorities for change and vote on a course of action that includes different components: what they could do themselves without outside help, what they could do with adult assistance and additional resources, and what they need others to do for them. Adults with experience in community organizing serve as mentors and role models, and local politicians visit to discuss how to move the selected goals through the political process. The groups of young people then set to work to implement their ideas, taking on progressively more challenging plans, and meeting with other groups from around the city to share their strategies and accomplishments. Some of the young people choose to carry the work forward through after-school clubs during the school year, and serve as peer mentors to new members.

Education for action in all spheres of life

The Danish educators Jensen and Schnack (1997) have promoted the concept of 'action competence,' which involves the capacity to analyze society and everyday life critically in order to understand the sources of environmental problems, and to find and work for solutions to problems at both the individual and societal level. They argue that these are essential skills for liberally educated students who take responsibility for themselves and the democratic management of their society. Too often, they charge, environmental education aims for behavior modification and offers disconnected activities in the place of opportunities for autonomy and critical analysis.

This article makes a similar argument, although it arrives at these conclusions from a different direction. It notes that environmental education, as well as measures of behavior in environmental education research, typically emphasize private sphere environmentalism at the expense of preparing students for public action, and environmental educators often fail to engage students in a strategic analysis of the most effective way to address problems. Because such an analysis shows that big institutions like government and industry are major sources of solid waste, pollution and the consumption of nonrenewable resources, as well as structural barriers against more conserving lifestyles, it is critical for schools and out-of-school environmental programs to prepare students for political action. We also argue that to do this effectively,

environmental educators can learn from the extensive research that has been done on young people's political development and processes that promote a child's basic sense of competence and sense of competence in working for common goals with a group.

Table 1 synthesizes key conclusions from these different bodies of research, and Table 2 distills practical recommendations for educators. A review of the tables shows that all four bodies of research point toward a model of education that not only aims to produce active citizens, but embeds democratic principles within the education process. According to all four fields of research, children and youth need to take personal ownership of the issues that they work on, choosing personally significant goals and integrating action for the common good into their sense of identity. They also need opportunities for direct experience, beginning with intimately known natural areas, and extending into participation in managing their school and in tackling community projects where they can see for themselves how local government works and feel that they are making meaningful contributions. In the course of these experiences, they need opportunities for discussion, analyzing public issues together, determining shared goals, resolving conflicts, and articulating strategies for overcoming challenges and achieving success. In the process, they become role models of success for each other.

[Place Table 2 about here.]

In advocating a political model of environmental education, we are aware of the pressures that many schools face to meet goals imposed by external authorities, rather than engaging students in strategically analyzing and setting their own goals. In our own country, the United States, environmental educators face strong pressures not to advocate any political position. Engaging young people in democratic processes, however, means enabling them to come to their own decisions based on the information they gather and the discussions they share. It means helping them to seek the common good despite gaps in knowledge and diversity in perspectives, acknowledging that their decisions need to be responsive to consequences and open to revision. Defending young people's right to navigate these processes is equivalent to defending the role of schools to prepare students for authentic democratic citizenship.

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Table 1: Conditions that foster responsible environmental behavior, civic action, the development of individual competence and collective competence

	Responsible Environmental Behavior	Civic Action	Sense of Individual Competence	Collective Competence
Role Models and Mentors	• Parents and family members as role models, as well as teachers and friends	• Parents and other family members as role models	• Vicarious experiences through role models and mentors • Instructive modeling	• Fellow group members as role models
Everyday Life Experiences	• Positive experiences of nature • Observation of the destruction of valued places • Reading books on nature and the environment	• Confrontations with social inequities and environmental problems • Opportunities for collaborative decision making from early childhood on • Having one's voice valued • Community service opportunities		
Participation in Organizations	• Participation in environmental clubs and organizations, often over an extended period of time	• Participation in school councils, youth boards, Model UN, and service organizations		• Participation in groups formed around shared goals and interests
Discussion		• Discussion of civic issues	• Verbalizing strategies for success	• Discussion and conflict resolution
Achieving Success		• Opportunities to see meaningful gains from collective action	• Mastery experiences • Interim sub-goals on the way to distant goals	• Opportunities to taste success through the accomplishment of shared goals
Social Network		• Supportive social network		• Trusting group members, developing personal relationships, being with friends and having fun
Education	• Knowledge about environmental issues	• Knowledge about public issues and how government works • Community- based projects		
Development of Action Skills	• Practicing environmental action skills	• Practicing activism	• Guided practice	• Coordination of actions and unified effort
Personal Significance	• Taking ownership of environmental issues	• Developing a civic identity	• Personally significant goals • Taking initiative	• Projects initiated by participants

Table 2: Practical application of research findings for environmental educators

	Practical Applications for Environmental Educators
Role Models and Mentors	• Engage both peers and adults as role models • Create opportunities for peer group exchanges • Encourage role models to practice instructive modeling by demonstrating skills of graduated difficulty and verbalizing strategies for success
Everyday Life Experiences	• Make time for children to experience nature, individually and as a group, enabling them to develop bonds with nature • Practice democratic decision-making in the classroom • Provide opportunities for everyone's voice to be heard and valued
Participation in Organizations	• Build club and organization activities around the shared values of the group and personal interests of individual participants
Discussion	• Make time for the discussion of environmental issues
Achieving Success	• Help participants set goals and sub-goals that will provide opportunities to taste success
Social Network	• Create a supportive social network for children and youth to build trust in others and have fun during the process
Age-appropriate Initiatives	• Determine the scope of environmental activities based on the developmental stage of the child, with a focus on the nearby environment with younger children, expanding to the local community by middle childhood and eventually global connections
Development of Action Skills	• Enable children and youth to test their environmental action skills, applying the principles of guided practice
Personal Significance	• Provide opportunities for children and youth to initiate environmental actions themselves
Parent Involvement	• Reach out to parents to convey the importance of democratic parenting • Encourage parents to take an active and supportive role in their child's experiences of nature and participation in community projects