YOUTH-ADULT PARTNERSHIPS CREATING POSITIVE ENVIRONMENTAL CHANGE

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When youth create positive environmental change in their communities they typically act with adult guidance. The role of adults, however, is largely absent in literature around youth participation in environmental action. This research explored through phenomenological interviews with 33 practitioners (e.g., teachers, extension educators, community organizers) facilitating youth environmental action in formal and non-formal educational settings across the U.S.: (a) ways practitioners involved youth in environmental action, (b) purposes and goals motivating practitioners to engage youth in environmental action, and (c) methods practitioners used to facilitate youth environmental action. The study sought insight into successful and challenging experiences. It also inquired about the meaning of these experiences for participating youth through group interviews with 46 youth in 9 programs.

Practice accounts included multiple forms of action among five types: physical improvements, community education, inquiry, advocacy, and contributions to community development. Practitioners described purposes integrating multiple individual, environmental, and community development goals. Most placed higher value in developing youth as citizens and change agents than in promoting environmental improvements.

Evident in practitioners' narratives was a tension between encouraging youth autonomy while maintaining authority. Practitioners experienced and managed this 'autonomy-authority duality' differently but all described characteristics of youth-adult partnerships. Nine practice themes emerged: creating safe spaces; providing structure; building relationships; bridging differences; setting rigorous expectations; providing opportunities for meaningful contribution; supporting youth; expanding horizons; and connecting youth with community. Youth reported learning in physical (e.g., fitness), intellectual (e.g., technological skills), psychological (e.g., initiative), and social (e.g., teamwork) domains. Parallel themes with youth development literature suggest environmental action is a valuable context for positive youth development.

The interplay of science education and community action evident in practitioner and youth interviews suggests the merit of a theoretical framework where environmental action occurs at the intersection of inquiry-based science education and youth civic engagement. Participation in environmental action enhanced some youths' capabilities in 'practical inquiry' and influenced some youths' perceptions of themselves from passive to active citizens. Environmental action concurrently involves youth in civic and scientific processes through which they can develop the critical dispositions and skills characteristic of both endeavors.

BIOGRAPHICAL SKETCH

Tania Marie Schusler was born in Spokane, Washington to Robert and Nancy Schusler in 1971. She grew up in the small community of Roscoe in northern Illinois. Tania graduated as valedictorian from Hononegah Community High School in 1989. She earned a B.S. in Forestry with a major in Environmental Science and Natural Resources from the University of Illinois at Urbana-Champaign, where she graduated with the University's highest honor of Bronze Tablet in 1993. Throughout her undergraduate education, Tania was active in the University YMCA, where she served as a leader in campus organizations dedicated to environmental protection and social justice. The knowledge and skills she gained through these experiences highly complemented what she learned in the classroom.

In 1993, Tania served as an environmental resource intern with the National Wildlife Federation in Washington, D.C., where she gained insight into the national public policy process. While appreciating the important influence of national public policy on environmental and social issues, Tania realized that she personally could have greater impact by working with others to take voluntary action at the local level. From 1994-1998, she managed a statewide volunteer program for the Wisconsin Chapter of The Nature Conservancy (TNC). At the Conservancy, she recognized the need for more systematic information about the human context of conservation, as well as the need to better integrate knowledge of ecological and social systems. Her involvement in TNC's community-based conservation efforts led her to undertake research in this area at Cornell University.

In 1998, Tania entered the Resource Policy and Management concentration in the field of Natural Resources with a minor in Conservation

and Sustainable Development. Her research, which occurred amidst public controversy over fish and wildlife management in New York's Eastern Lake Ontario Bay, explored social learning in the development of collaborative natural resource management between the state agency and local communities. In consultation with the New York State Department of Environmental Conservation and local stakeholders, she designed a participatory planning process for the Lake Ontario Islands Wildlife Management Area. Her research assessed how characteristics of that process contributed to social learning among participants. She received her M.S. in 2001.

Tania then began a doctoral program in Natural Resources at Cornell University with minors in Education and Human Development. Her doctoral research expanded on her interests around community participation in natural resource management to explore youth participation in local environmental issues. This focus grew out of her experience participating in student environmental and social justice groups in her late teens and early twenties. Recognizing the powerful influence of those experiences in her own life, she sought to understand how one could create such opportunities for other young people. This dissertation is the culmination of that effort. Since 2003, Tania has also served as extension resource educator with Cornell Cooperative Extension of Tompkins County where she provides leadership for community education around environmental and sustainability issues.

To Mom and Dad

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I thank all of my family for their love and support and especially my parents for instilling in me the value of education. I would also like to acknowledge the fond memories of my grandparents and great aunt and uncle, which remind me what matters in life. I am deeply grateful to Ernesto Ruelas Inzunza for his love, friendship, and emotional support. I am fortunate to have a wonderful group of friends near and far. I mention those who are local, in particular Sara Barker, Heather Clark Dantzker, Mark Dantzker, and Shelagh Smith, but my thanks go to all in Roscoe, Madison, Chicago, throughout the eastern and western U.S., and around the world. I also thank Joel Bernier for sharing his enthusiasm for life and giving reason to persevere in this endeavor.

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CHAPTER 1

INTRODUCTION

This research grew out of my own experience in my late teens and early twenties participating in collective action through student environmental and social justice groups at the University YMCA in Champaign, IL. That experience was transformative for me. It opened my eyes to view the world in new ways and led me to pursue a career and further education in the environmental field. The practical understanding of environmental and social issues that I gained through volunteering with these student organizations complemented well the “book knowledge” acquired through coursework in ecology and social sciences. The skills (e.g., organizing, communicating, planning, facilitating) I developed were critical to obtaining my first professional position once out of school. At a conference at the University of Wisconsin-Stevens Point, which I attended while working for The Nature Conservancy in the late 1990s, I met a teacher and some of his students involved in a hands-on environmental project in their local community. Such an opportunity had not existed in my high school. I was intrigued to learn that experiences similar to those I experienced in college were available for younger students.

Relatively early in my doctoral program I had the fortunate opportunity to teach in an area high school as a fellow in the Cornell Environmental Inquiry Research Partnership, later called the Cornell Science Inquiry Partnership, or CSIP (CSIP 2006). Funded by the National Science Foundation, CSIP partnered Cornell graduate students with secondary teachers toward the goal of enhancing inquiry learning and updating science content taught in rural and urban schools. I was placed with a talented biology teacher, Linda Tompkins,

who previously facilitated her students' participation in watershed related community-based projects, such as a water quality investigation that resulted in the implementation of erosion control measures along a local stream bank (Tompkins 2005). Adding a new twist to Ms. Tompkins' past projects, we let students decide the topic for their community-based research (as well as the process by which they would choose that topic). Spurred by a controversy over possible expansion of the Seneca Meadows landfill, students voted to investigate the environmental, economic, and social impacts of the landfill on their community (Tompkins 2005).

The yearlong project included several highlights and challenges. Among the highlights was a student initiated, organized, and implemented public forum that presented diverse views on the issue through a panel discussion featuring an engineer from the state environmental agency, the landfill manager, a town board official, and an environmentalist. I personally found several aspects of the project challenging: managing complex project logistics; maintaining momentum because some students' interest waned as the controversy that spurred selection of this topic cooled in the community; accommodating varying student abilities; and assessing the performance of students involved in different tasks contributing to the overall project goals. I quickly realized that providing opportunities for youth to engage with environmental issues in their community was a much more complex and challenging endeavor than I had imagined.

An increasing number of environmental education (e.g., Earth Force, Project Wild's Science and Civics, Project Learning Tree's GreenWorks), science education (e.g., Garden Mosaics), and youth development (e.g., Public Adventures) programs include an action component. From an

environmental education perspective in the U.S., education about, through, and from action (McClaren and Hammond 2005) contributes to environmental education goals including the development of questioning and analysis skills, knowledge of environmental processes and systems, skills for understanding and addressing environmental issues, and personal and civic responsibility (NAAEE 2004). While curricula and program materials offer useful guidance on how to proceed in an action project with youth, my experience led me to believe that the practice of engaging youth in local environmental action was more nuanced and complex than evident from existing curricula and program guides.

Although some useful references integrating theory and practice exist (e.g., Hart 1997, Driskell 2002), I found in both popular and scholarly literature either vague or no treatment of the practitioner's role in creating opportunities for youth participation in environmental action. Thus, I undertook this research from a personal desire to understand better how one can create opportunities for youth similar to those that I had found powerful when I was a young person and a professional desire to contribute understanding that would advance theory and practice in this arena of growing interest. Maxwell (2005) described an interactive model for research design in which the researcher moves back and forth between five design components to assess the implications of goals, research questions, theories, methods, and validity threats for one another. Adapting this perspective, I next explain the interconnected design components of my research (Figure 1.1). I begin with the broad goals I intended it to serve followed by my specific research objectives, conceptual framework, methodological approach, and strategies for ensuring validity.

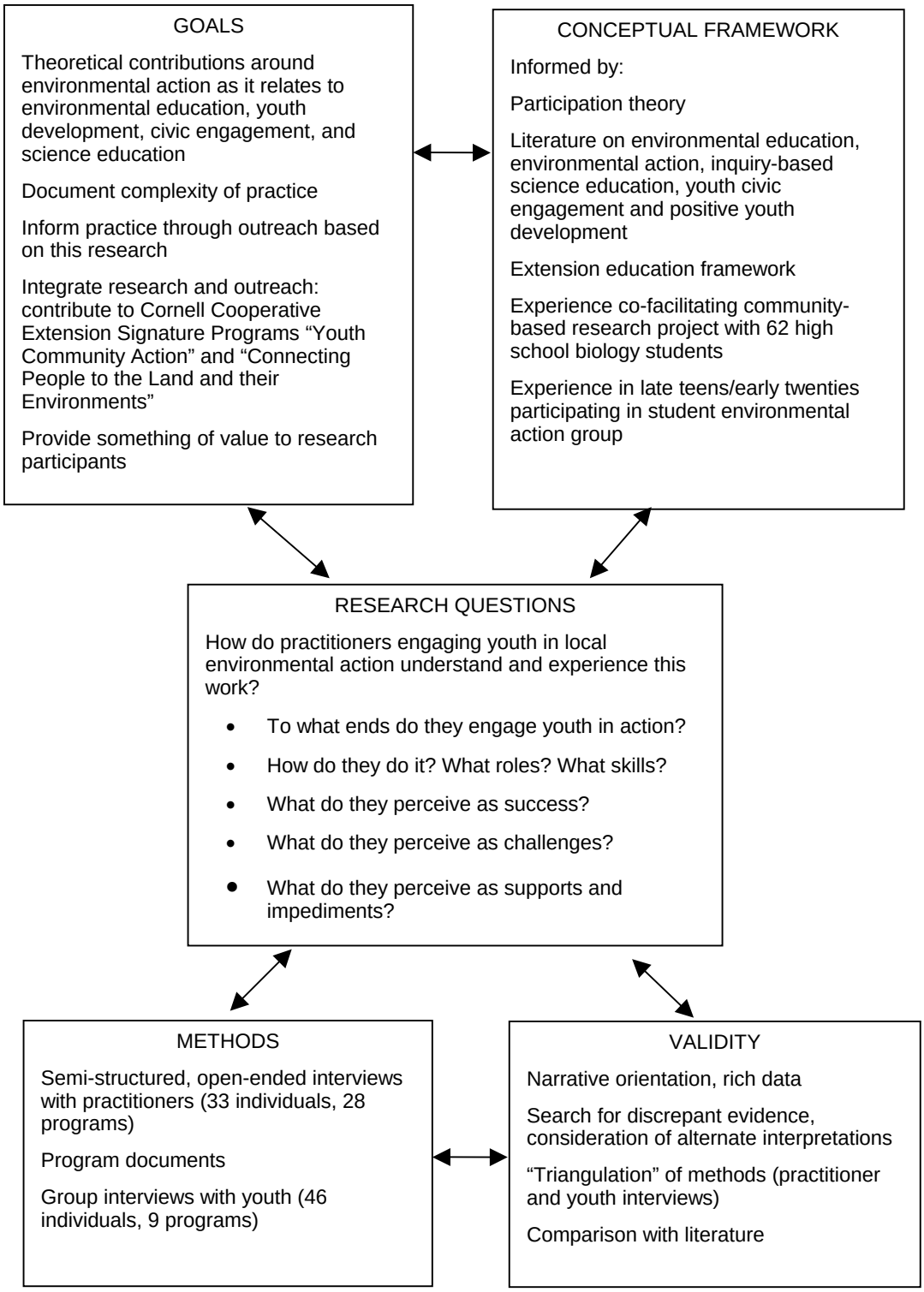

Figure 1.1. Research design using Maxwell's (2005) model.

Broad Goals

Intellectual, practical, and personal goals guided the design of this research (Maxwell 2005). As stated above, it grew from a personal interest in the topic and a normative belief that the experience of participating in environmental action can be positive, even transformative, for some participants. Environmental action projects are not always successful, and the experience is more meaningful for some participating youth than others (Schusler and Krasny 2007). It is clear, however, that participation in local environmental action *can* be a powerful experience for youth that also contributes to tangible environmental improvements in communities (e.g., Hart 1997, Adams and Ingham 1998).

Practically speaking, I sought to design research that would be of value to practitioners interested in engaging youth in local environmental action. My intent was to conduct research that could inform practice by learning from the experiences of those doing it successfully (as perceived by their peers) and presenting that learning in a way that would allow others to transfer or adapt it to their own purposes and contexts. Because I work with Cornell Cooperative Extension and this research was funded through federal formula funds from the Cornell University Agricultural Experiment Station, I was interested in conducting research that would be of particular value to extension educators, although I hoped it would be of interest to a broader audience. Within New York State, youth participation in environmental action overlaps with two Signature Programs of Cornell Cooperative Extension: Youth Community Action and Connecting People to the Land and to their Environments. Insights from this research can help advance those programs. Finally, I hoped that this research would provide something of value to participating practitioners,

whether through the opportunity to reflect on their practice, the recognition provided by their inclusion in research conducted at a major university, or the insights that they might gain from the research results.

From a scholarly perspective, the intellectual goals are of greatest interest. This research drew upon conceptual frameworks integrating literature in the fields of environmental education, science education, participation, youth civic engagement, and youth development. My main intellectual goal was to enhance theoretical understanding of environmental action by integrating theoretical concepts from multiple disciplines with the tacit knowledge and theories evident in the empirical experiences described by practitioners. Because this research crosses many disciplinary boundaries, its depth within any single field is limited; however, it offers novel insights from the application of theoretical concepts from one discipline to another.

Research Question and Objectives

I designed this research to address the broad, guiding question: *How do practitioners engaging youth in local environmental action in the U.S. understand and experience this work?* The practice of these individuals is of particular interest because its participatory character is atypical in U.S. schools, many youth programs, and communities. It reflects a fundamentally different relationship among youth and adults because it involves sharing decision-making power. My research aimed to accomplish multiple objectives:

1. To understand the purposes and goals motivating practitioners to engage youth in local environmental action.

2. To understand the ways in which practitioners perceive success and challenges.
3. To gain insights into how practitioners facilitate youth participation in local environmental action.
    a. To gain insights into principles guiding their practice.
    b. To identify specific strategies and tools used to engage youth.
    c. To identify contextual forces (e.g., institutional support, curricula, funding) supporting or impeding them in this work.
4. To develop theoretical insights that can inform the practice of engaging youth in environmental action and suggest propositions for future research.

Within New York State, I also gained insights into young people's perspectives of their experiences in environmental action programs or projects toward these additional research objectives:

1. To understand the experiences of youth participating in local environmental action, including descriptions of their activities, perceptions of their overall experiences, and reflections on what and how they learned.
2. To explore youth perceptions of civic engagement and science in the context of their participation in local environmental action.

Conceptual Framework

Because I describe theoretical frameworks at depth within each chapter, I provide only a brief overview here of each chapter's theoretical foundation.

I review theory around environmental action in Chapter 2. I provide justification for environmental action as an approach that addresses concerns around environmental education's deterministic aim of influencing individual behavior (Jickling and Spork 1998) while neglecting economic, social, and political structures that constrain environmental improvement (Robottom and Hart 1995, Jensen and Schnack 1997). I discuss what constitutes environmental action and its educational aim of developing learners' competence to participate in democratic society. This theoretical background provides a useful foundation for comparison with practitioners' perspectives on environmental action and its aims.

I situate environmental action within theory of participatory democracy and youth participation in Chapter 3. Citizens develop the capabilities for democratic participation through the process of participating (Pateman 1970). This educative function provides justification for young people's participation in community issues to develop future citizens. In addition, some scholars argue that children have current rights and responsibilities as citizens and are capable of making valuable contributions to communities (e.g., Hanna 1936, de Winter 1997, Hart 1997, Eames-Sheavly 1999, Chawla and Heft 2002, Driskell 2002). Youth participation occurs in many forms with varying degrees of youth influence in decision-making (Hart 1997, Driskell 2002). The role of adults has been largely absent in both popular stories and scholarly literature around youth participation in environmental action. I focus in Chapter 3 on the

interactions between youth and adults described by practitioners to understand better the complexity of shared decision-making in participatory practice.

Through the course of this inquiry I came to understand environmental action as an important context for positive youth development, which I describe in Chapter 4. I draw on a youth development framework (Eccles and Gootman 2002) to interpret young people's descriptions of the ways in which they grew through their participation in environmental action. I then compare themes identified independently through interpretation of practitioners' accounts of environmental action with features of positive developmental settings (Eccles and Gootman 2002) to illustrate the striking parallels between these accounts and positive youth development.

I develop a theoretical framework that envisions environmental action as the intersection of inquiry-based environmental science education and youth civic engagement in Chapter 5. Narrow conceptions of science as an objective, static body of facts and civic engagement as fulfilling one's responsibility to vote offer little opportunity for integration. When we consider science as inquiry (NRC 1996, 2000), on the other hand, and civic engagement as influencing choices in collective action (Camino and Zeldin 2002), several shared characteristics of scientific practice and civic engagement are evident. These include questioning assumptions, understanding systems, considering alternative explanations or options, and debating critically within a community. I explore the integration of science education and civic engagement through environmental action drawing on youth and practitioner data from formal and non-formal educational settings in New York State.

Definitions

For clarity, I define below terms frequently used throughout the dissertation.

Environment – For the purposes of this research, I defined environment broadly to include both natural and built environments.

Environmental action – Emmons (1997) defined environmental action as a deliberate strategy involving decisions, planning, implementation, and reflection by an individual or a group that is intended to achieve a specific environmental outcome. In theory, action is distinct from behavior, activity, movement, or habit because it is intentional and targeted at the root causes of a problem (Jensen and Schnack 1997). Most examples of environmental action considered in this research involved collective action occurring at a local level, although two examples occurred at a statewide level.

Practice – As illustrated by the diverse case studies on educational practice in a collection edited by Schön (1991), researchers define and bound practice differently. For the purposes of this study, practice involves a collection of different activities undertaken toward some unifying purpose. In the context of education, practice embodies values and beliefs about what is worthwhile learning and how learning should be pursued (Pring 2000).

Practitioner – In this study, practitioners refers to individuals employed in positions as teachers, extension educators, non-formal science educators, youth program managers, community organizers, and program directors.

Program – For simplicity, I use the term program to refer to the broad array of educational contexts in which practitioners interviewed in this research were working. These included summer programs, after-school programs, and

science classes occurring in non-profit organizations and schools (i.e., both non-formal and formal education).

Methodological Approach

I decided qualitative research was suitable for this study because the practice of engaging youth in local environmental action is an understudied domain. Insufficient understanding existed to focus a study on a specific aspect of practice; rather a more holistic, comprehensive approach was needed that would provide a detailed view of the topic and contribute to theory-building (Creswell 1998, Shavelson and Towne 2003). My epistemological stance was interpretive, and my focus was on the meaning of experience and actions rather than on explaining or predicting traits or behaviors. As Schwandt (2000) explained:

> From an interpretivist point of view, what distinguishes human (social) action from the movement of physical objects is that the former is inherently meaningful. Thus, to understand a particular social action (e.g., friendship, voting, marrying, teaching), the inquirer must grasp the meanings that constitute that action (Schwandt 2000: 191).

Phenomenology informed this research in its emphasis on understanding the *meaning of experience*, in this case the experience of practitioners engaging youth in local environmental action. Tesch (1990) explained how phenomenology differs from other qualitative approaches:

> Phenomenological research differs from naturalistic and ethnographic approaches in its emphasis on the individual, and on subjective experience. Rather than studying the impact of a program designed to facilitate the integration of minority students, for instance, or studying the culture of the multi-racial classroom, or the interactions among children of different races, phenomenology would study what the experience of being in a multi-racial classroom is like, or what the experience of being a minority student (or majority student) in an integrated classroom is like (Tesch 1990: 48).

I considered conducting an ethnographic study of a single case, which would have allowed me to explore youth participation in environmental action from multiple perspectives (e.g., practitioners, youth, community members) and through multiple methods (e.g., interviews, participant observation). An ethnographic approach could have contributed useful theoretical and practical insights through the in-depth understanding of a single case; however, it would have been difficult to discern the transferability to other situations. I chose instead to focus primarily on understanding practitioners' perspectives across multiple cases. Practitioners play central roles facilitating youth participation in environmental action. Understanding these experiences from their points of view is important to avoid misinterpreting practice, for example, by attributing meanings to actions observed that differ from practitioners' own. A phenomenological approach enabled me to gain insights into and identify patterns among the diverse ways in which practitioners experienced and understood the practice of engaging youth in environmental action.

Originating from the philosopher Edmund Husserl in the early 20th century, phenomenology as a tradition of research has evolved in numerous schools of thought (e.g., empirical, transcendental, dialogical) and been applied differently in different fields (e.g., psychology, sociology, education) (Tesch 1990). This research does not follow a pure phenomenological approach, such as the methodological procedures of transcendental phenomenology outlined by Moustakas (1994). It does, however, presume some of the epistemological tenets of phenomenology by (a) focusing on what an experience means for persons who have had the experience and are able to provide a comprehensive description of it (Moustakas 1994, Schram 2003); and (b) assuming that dialogue and reflection can reveal the essence or

central underlying meaning of some aspect of shared experience (Schram 2003).

I also used a narrative orientation in data collection and to some degree data interpretation. Through semi-structured, open-ended interviews, I encouraged practitioners to share narratives of their practice. This approach presumed that narratives would illuminate tacit knowledge and theories embedded in the practice accounts (Dodge et al. 2005). Thus, I used narrative as a tool to obtain information (Ospina and Dodge 2005) about the practice of engaging youth in local environmental action. Forester (1999) demonstrated the value of learning from practice narratives in revealing the complexity of practice; providing insights into interests, cares, and commitments; and enabling readers to see their own practical situations and possibilities anew. The tensions within practice lead to fresh lines of theoretical inquiry and insightful theorizing can provide suggestive avenues for practice (Forester 1999).

Sampling

I purposefully selected the practitioners interviewed (Patton 1990). Identified through peer referrals or national award programs, their practice shared criteria central to the focus of this study: some form of environmental action and some degree of shared decision-making with youth. In addition, I limited selection to individuals working with youth ages 10-18. All were in paid positions; the scope of this study did not include volunteers. Beyond these shared criteria, I sought to include individuals working within diverse contexts that might have implications for their practice (Table 1.1).

Table 1.1. Sampling criteria.

Interviewees' practice shared characteristics	**Practitioners worked in diverse contexts**
• Environmental action • Youth participation with some degree of shared decision-making • Youth ages 10-18	• Formal or non-formal educational settings • Urban, suburban or rural locations • Action projects around a variety of environmental issues

My co-researchers[1] and I interviewed 33 practitioners (18 female and 15 male; 7 persons of color and 26 white) working in 28 different organizations. These included teachers, community organizers, youth development specialists, extension educators, and program directors working in formal and non-formal educational settings in cities, suburbs, and rural areas (Table 1.2). Practitioners varied in their backgrounds, professional experience, and formal educational training. They engaged young people in environmental action through environmental education programs, science classrooms, science clubs, youth development programs, and community organizations with missions around environmental justice, food systems, community gardens, architecture, and community development (Appendix A). For some, environmental action was a central focus of their work with youth, while for others it was a small component.

[1] T. Schusler conducted 30 interviews, M. Simsik conducted two, and J. Simon conducted one.

Table 1.2. Work contexts of practitioners interviewed.

Position	Teachers, community organizers, youth development specialists, program directors, extension educators
Programmatic context	Environmental education, science education, youth development, community development
Educational setting	24 non-formal settings, 9 schools
Location	21 urban, 5 rural, 3 suburban, 2 small city, 2 statewide
Geographic region of U.S.	22 Northeast, 5 Southeast, 4 West coast, 2 Midwest
Examples of issues in which practitioners engaged youth in environmental action	Alternative fuels, air quality, community gardens, environmental justice, green building, habitat restoration, sustainable agriculture, sustainable living, water quality, and wildlife habitat

Data collection

Data collection occurred primarily through interviews using a general interview guide (Appendix B), which outlined a set of issues to be explored through questions that the interviewer adapted in wording and sequence to specific respondents in the context of the actual interview (Patton 1990). Researchers conducted semi-structured, open-ended interviews with 33 practitioners working in 28 different organizations at which point it appeared that saturation in central concepts of interest had been reached. Researchers interviewed practitioners based in New York State in person and others by telephone.

Each interview began with general questions about the individual and her work followed by the telling of a specific success story usually identified by the practitioner. For some, mostly those having won national awards, the interviewer requested that they relay the story of the specific project for which they had been selected for inclusion in the research. Throughout, the interviewer posed context-appropriate probes to solicit additional details as well as questions encouraging the interviewee to reflect upon the meaning of her experience. Finally, the interview concluded with questions designed to

encourage interviewees to add new perspectives not yet captured. Each interview lasted 33-86 minutes with most lasting about an hour; all but one were audio recorded and transcribed by a professional clerical assistant. I reviewed transcripts against the original recordings for accuracy and the transcribed text became the data used for analysis and interpretation.

In addition to practitioner interviews, I reviewed program materials, such as newsletters, brochures, annual reports, and web sites. When at all possible within New York State, a co-researcher[2] and I also conducted group interviews with participating youth present on the day of a site visit. Forty-six youth in nine programs participated in ten group interviews (see Chapters 4 and 5). The interview guide for youth inquired about participants' activities in a program or project, perceptions of their overall experience, what they felt that they learned or gained through the experience and how they learned it, and thoughts on how their experience connected with science and how it influenced their understanding of what it means to be a good community member (Appendix B).

Data transformation

Wolcott (1994) described moving from data in the form of participant observation notes or interview transcripts to descriptive, analytic, and interpretive accounts as a process of data transformation. I transformed data differently as suitable to different inquiry objectives. I describe specific procedures used in analysis and interpretation within each chapter.

[2] T. Schusler conducted eight focus groups. In addition, T. Schusler and J. Simon co-conducted one and J. Simon conducted one other.

Validity

Social scientists debate criteria for assessing the quality of results from qualitative inquiry. More important than agreement upon universal criteria is that a researcher makes explicit the strengths and limitations of her research approach. Maxwell (2005) used the term validity in a commonsense way to refer to the correctness or credibility of a description, conclusion, explanation, or interpretation. In other words, how might I be wrong? Below I state threats to validity in this research and describe the strategies used to address them.

My reliance on interviews poses limitations. A trade-off exists between immersing oneself in a setting (depth) and collecting data across a range of diverse contexts (breadth). Interviewing practitioners working in 28 different programs provided opportunity to learn from a broader range of experiences from cases across the U.S. but limited my ability to collect data in other ways (e.g., participant observation; interviews with youth in all cases; interviews with community members). Given this, ensuring that interviews produced trustworthy practice accounts was critical.

Untrustworthy accounts might arise from reactivity, or the influence of the interviewer on interviewees' responses. For instance, did practitioners tell me what they thought would impress me? Other factors like memory recall also influence the trustworthiness of practice accounts. My main strategy for addressing these threats was the use of narrative through practitioners' telling of a success story during interviews. The narratives produced rich data – data sufficiently detailed and varied that they provide a full and revealing picture of what is going on (Maxwell 2005) – that integrated practitioners' descriptions of experience with their reflections on its meaning. Probing for examples and illustrations during interviews led to interpretations grounded in actual

experience. It is impossible, and in my opinion not even desirable, to eliminate entirely the interviewers' influence on the interview situation. But it is important to understand and when possible use it to advantage. My own experience facilitating a community-based environmental research and action project with youth enabled me to ask appropriate follow-up questions that encouraged practitioners to provide richer, more reflective accounts. This was especially useful for drawing out practitioners' specific roles and how they dealt with challenges and obstacles.

This research focused on successful examples of practice engaging youth in local environmental action. Success itself is a subjective concept. Practitioners included in this research were deemed successful by colleagues or through national awards. Group interviews conducted with youth in most cases in New York State confirmed whether youth participants also deemed a particular environmental action project or program successful.

Researcher bias, or selecting data that fit existing theory or preconceptions, is a common validity threat (Maxwell 2005). As stated earlier, my bias was to view youth participation in environmental action as a valuable experience; however, I did not enter the research with a preconceived notion of what practice does or should look like. I simply approached the interview with a favorable disposition toward the accomplishments of the projects in which interviewees were central. That said I did not take an uncritical perspective. I inquired about challenges, barriers, failures, and how practitioners would approach their practice differently with the benefit of hindsight. In analysis, I considered possible contradictions between practitioners' espoused theories and the theories-in-use embedded in their practice accounts (Argyris and Schön 1974). As I reached interpretations from

the data, I returned to the original transcripts seeking evidence that would disconfirm those assertions and considering alternative explanations (Maxwell 2005). I present contradictions evident in the data as relevant to specific themes. Comparison with the literature also enhanced validity. Interestingly, I began the research familiar with the literature around environmental action and youth participation. In analyzing and interpreting interview data, I found strong consistency with theory and empirical research in the youth development field.

This study contributes from a U.S. perspective to an area of international research interest around participation in environmental and health education (Reid et al. 2007), but it is questionable whether the findings, limited to a U.S. focus, would be relevant or transferable in other countries. This research did include practitioners working in diverse cultural contexts within the U.S. For example, some worked in predominantly white affluent suburban communities, others in predominantly white poor rural communities, and others still in predominantly Latino or African-American poor urban communities. They also worked within different institutional cultures (e.g., schools, community organizations). The research was not designed to discern the influences of these diverse cultural contexts on practice. Rather, the inclusion of diverse cases suggests that themes emerging across interviews might be more transferable to a wider array of practice settings than those present only among urban-based practitioners or science educators, for instance.

Organization of the Dissertation

This introduction described the interconnected design components of this research. Each of the main chapters has been prepared as a stand-alone paper addressing different research objectives (Table 1.3). In Chapter 2, I compare theoretical and practitioner perspectives on environmental action with a focus on educational aims. Integrating theoretical and practical perspectives, I present a simplified model relating youth participation in environmental action to the development of citizens capable of participating in other spheres of democratic life.

In Chapter 3, I discuss a central theme evident in practice accounts: a tension between granting and retaining control in shared decision-making with youth. I describe how practitioners experienced this tension, which I conceptualize as a duality consisting of youth autonomy and practitioner authority. I conclude that managing this duality involved partnering with youth (Camino 2000, Zeldin et al. 2005b). In Chapter 4, I depict environmental action as a context for positive youth development. I describe parallels in young people's descriptions of their environmental action experiences and practitioners' narratives of guiding youth in action with theory and empirical research in the youth development field.

In Chapter 5, I explore environmental action as an intersection of inquiry-based science education and youth civic engagement. I draw on youth and practitioner data from programs in New York State to illustrate the interplay of science and civic engagement in environmental action, as well as opportunities and challenges in their integration. Finally, in Chapter 6, I conclude by summarizing contributions of this research and suggesting directions for future inquiry.

Table 1.3. Overview of main dissertation chapters.

Dissertation chapter	Theoretical frameworks	Research objectives
Chapter 2 – "Growing more than collards: developing citizens and change agents through environmental action"	Environmental education, environmental action and its educational aims	To understand the purposes and goals motivating practitioners' to engage youth in local environmental action. To understand the ways in which practitioners perceive success.
Chapter 3 – "Youth adult partnerships creating positive environmental change" and Chapter 4 – "Environmental action as context for youth development"	Chapter 3 Participatory democracy and youth participation, particularly shared decision-making Autonomy-authority duality experienced by practitioners in shared-decision making with youth Youth-adult partnerships Chapter 4 Positive youth development	To gain insights into how practitioners facilitate youth participation in local environmental action. To gain insights into principles guiding their practice. To identify specific strategies and tools used to engage youth. To identify contextual forces (e.g., institutional support, curricula, funding) supporting or impeding them in this work. To understand challenges perceived by practitioners. To understand the experiences of youth participating in local environmental action by eliciting descriptions of their activities, perceptions of their overall experiences, and reflections on what and how they learned.
Chapter 5 – "Environmental action: integrating science education and civic engagement"	Youth civic engagement Inquiry-based science education Participatory action research	To explore youth perceptions of civic engagement and science in the context of their participation in local environmental action. To gain insights into how practitioners facilitate youth participation in local environmental action.
All chapters	All of the above	To develop theoretical insights that can inform the practice of engaging youth in environmental action and suggest propositions for future research.

CHAPTER 2

GROWING MORE THAN COLLARDS: DEVELOPING CITIZENS AND CHANGE AGENTS THROUGH ENVIRONMENAL ACTION

High school students in Souderton, Pennsylvania designed, raised funds for, and built an environmental demonstration home where they led programs to teach others about sustainable living. Teens in a summer program in Buffalo, New York transformed vacant lots in their low-income neighborhood into gardens and grew food to improve local food security. In the U.S., examples of youth creating positive environmental change in their communities are inspirational yet rare, but could become more common as a growing number of school-based and non-formal environmental education (EE) programs incorporate community action in their curricula (e.g., Earth Force www.earthforce.org, Garden Mosaics www.gardenmosaics.org).

In such cases, youth typically do not act alone; rather an adult, such as a teacher or community organizer, guides them in an action project. Working with youth in environmental action is a chaotic and time-intensive process. Were the sole goal to build an environmental demonstration home or transform vacant lots to gardens, practitioners in the environmental field would be prudent in terms of efficiency to leave youth out of the process. What purposes or goals motivate practitioners who do involve youth in action to create positive environmental change? To explore this question, we must first understand what constitutes environmental action and the types of action in which practitioners describe engaging youth. We can then ask: Toward what end?

In this paper, I review theory around environmental action, what constitutes action, and its educational aim. I then compare theoretical perspectives with those gleaned from phenomenological interviews with practitioners working in diverse settings who engaged youth in action addressing a range of local environmental issues. Interpretations developed through this inquiry suggest an area ripe for the attention of EE researchers interested in education that engages learners in a democratic process of examining and re-casting society rather than prescribes a particular set of values or visions and the associated behaviors to achieve them (Jickling and Spork 1998).

Environmental Action: Theoretical Perspectives

EE in the U.S. typically seeks to influence learners' individual environmental behaviors (Hungerford and Volk 1990, Kollmuss and Agyeman 2002) despite critiques that this dominant approach neglects to consider the broader historical, economic, social, and political constraints on environmental improvement (Robottom and Hart 1995, Jensen and Schnack 1997). For example, globalization and industrial agriculture restrict one's ability to eat locally and organically grown foods, particularly if one cannot afford the luxury of paying more for environmentally responsible products. One means to address these concerns is through environmental action (Jensen and Schnack 1997). In the above example, people might create a farmers' market, farm-to-school lunch program, or community supported agriculture to improve access to locally produced foods. They might also advocate changing governmental policies from favoring chemical-intensive, fossil-fuel dependent agriculture to supporting more sustainable food systems. Such efforts benefit from

integrating citizens' interests and sound science (Bishop and Scott 1998, see Chapter 5), for example, by incorporating scientifically-based nutritional guidelines in a farm-to-school lunch program.

The EE field lacks clarity around the concepts of action and behavior (Jensen 2002). Many authors use definitions like that below, which imply that action and behavior are interchangeable:

> By 'pro-environmental behavior' we simply mean behavior that consciously seeks to minimize the negative impact of one's actions on the natural or built world (e.g., minimize resource and energy consumption, use of non-toxic substances, reduce waste pollution) (Kollmuss and Agyeman 2002: 240).

In addition to assuming a deterministic role of education (Jickling and Spork 1998), in its emphasis on individual behavior, this dominant approach discounts the collective dimension of many environmental issues. As Robottom and Hart explained:

> … to represent environmentalism as demonstrating appropriate individual responses in the form of a single, pre-ordinate set of personal behaviors is to misrepresent the nature of the environmental problems that the personal behaviors are expected to ameliorate. … Fundamentally, environmental issues are political rather than technical in character. … Environmental issues are almost always political struggles, and collective action is usually more productive than individual efforts in the resolution of political struggles (Robottom and Hart 1995).

Indeed key scholars in the field who view behavior change as EE's aim also recognize issues investigation and action as an important component (Hungerford et al. 1990). The interchangeable use of behavior and action, however, muddies one's ability to consider the aims of EE with clarity. Thus, it is important to understand their distinctions.

Emmons (1997) defined environmental action as a deliberate strategy involving decisions, planning, implementation, and reflection by an individual or a group that intends to achieve a specific environmental outcome. Two

criteria distinguish environmental action from behavior and activity (Jensen and Schnack 1997). Unlike behavior, action is intentional, or consciously undertaken with reference to motives and reasons. Unlike activity, action is targeted at solutions to the root causes of a problem. Environmental action can be direct or indirect. Direct actions contribute directly to solving the environmental problem at hand (people-environment relations), while indirect actions influence others to contribute to solving the environmental problem in question (people-to-people relations) (Jensen and Schnack 1997).

Confusion in the literature between behavior and action perhaps reflects a tension inherent within the goals of EE, which include both environmental and participatory outcomes. EE objectives identified in the 1977 Tbilisi Declaration, the guiding framework for EE worldwide, are environmental Awareness, Knowledge, Attitudes, Skills, and Participation (UNESCO 1978). Likewise, guidelines for K-12 EE in the U.S. include not only developing understanding and skills related to environmental processes, systems, and issues, but also developing personal and civic responsibility (NAAEE 2004). The Decade of Education for Sustainable Development (DESD) also encompasses goals of sustainability and participation. While, “the overall goal of the DESD is to integrate the values inherent in sustainable development into all aspects of learning to encourage changes in behavior that allow for a more sustainable and just society for all” (UNESCO 2005b), UNESCO’s vision and definition of ESD include learning to “be caring citizens who exercise their rights and responsibilities locally, nationally and globally” (UNESCO 2005a). Each of these influential guiding frameworks seeks to develop pro-environmental or pro-sustainability behaviors through participatory processes.

A contradiction lies within these goals. In its emphasis on participation, the EE community must accept that learners, as participants and citizens, might have different conceptions of environmental problems and their solutions and choose to act differently, or not at all, from prescribed behavioral outcomes (Jensen and Schnack 1997, Jickling and Spork 1998). Jickling (1992) and Jickling and Spork (1998) problematized well the difficulties of constructions like “education for the environment” (Fien 1993) or “education for sustainable development” (UNESCO 2005b). Although powerful rallying symbols for educational movements, these constructions prove problematic because they prescribe a particular set of values and visions. Jickling and Spork (1998) called for EE that engages learners in the process of developing their own values and contributing to evolving societal values regarding the environment.

I do not argue for eliminating the tension between environmental and participatory outcomes in EE. The above guiding frameworks have and continue to serve the field well. In addition, such tensions, or dualities, drive innovation and creativity (Barab et al. 2003, Baek and Barab 2005). I do believe, however, that as researchers, we must be more mindful of this tension and its implications for our work, which I will return to in this paper’s conclusion.

The goal of participation is central in EE approaches involving action. Consensus exists that the educational aim of environmental action extends beyond developing environmental understanding to developing learners’ capabilities to participate as citizens in democratic society (Emmons 1997, Hart 1997, Jensen and Schnack 1997, Bishop and Scott 1998, Driskell 2002, McClaren and Hammond 2005, Chawla 2007). Jensen and Schnack (1997)

offered the concept of “action competence” as a formative ideal in a democratic approach to education. Action competence involves the “capability –- based on critical thinking and incomplete knowledge –- to involve yourself as a person with other persons in responsible actions and counter-actions for a more humane world” (Schnack in Simovska 2000: 30). Researchers developing the action competence concept have described as its dimensions: insight and knowledge, commitment, visions, and action experiences (Jensen and Schnack 1997, Jensen 2000, 2002, Jensen and Schnack 2004). An action competence approach to environmental education accepts that a learner might choose not to act, or to act counter to environmental protection; what is important is that the learner develops the ability to critically assess a situation and act, or not, based upon his or her assessment, interests, and values (Jickling and Spork 1998).

In light of this theoretical discussion, how do the views of practitioners who are engaging youth in local environmental action compare? What purposes and goals motivate them to involve youth in action? To solve environmental problems? To influence learners’ environmental behaviors? To develop future environmental leaders, activists, or citizens? I explored these questions through phenomenological inquiry. I describe this methodological approach next. I will then share interpretations from practitioners’ descriptions of:

- the forms of action in which they engaged youth;
- their purposes and goals; and
- their perceptions of success.

Finally, I will discuss contributions of practitioners' perspectives to enhanced theoretical understanding of environmental action and the implications for EE research.

Methodology

My interest was in understanding environmental action from the perspectives of practitioners facilitating it in order to avoid misattributing meaning to their practice; thus, I chose a phenomenological approach. Phenomenology presumes that through dialogue and reflection one can understand the meaning or essence of an experience for those experiencing it (Tesch 1990, Creswell 1998, Schram 2003). I also used a narrative orientation in data collection. In semi-structured, open-ended interviews, my co-researchers and I encouraged community organizers, teachers, extension educators, and other practitioners to share their practice stories. This approach presumed that narratives would illuminate tacit knowledge and theories embedded in the practice accounts (Dodge et al. 2005). Forester (1999) and others (e.g., Chase 1995, Hart 2003) have demonstrated the value of narratives for revealing the complexity of practice; enabling readers to see their own practical situations and possibilities anew; and leading to fresh lines of theoretical inquiry.

Using purposeful sampling (Patton 1990), I selected individuals identified through peer referrals or national award programs. Their practice shared criteria central to the study's focus: some form of environmental action and some degree of shared decision-making with youth. In addition, I limited selection to professionals working predominantly with youth ages 10-18. Beyond these shared criteria, I sought to include individuals working within diverse contexts that might have implications for their practice (Table 2.1). For

some, environmental action was a central focus of their work with youth, while for others it was a small component.

Table 2.1. Work contexts of practitioners interviewed.

Position	Teachers, community organizers, youth development specialists, program directors, extension educators
Programmatic context	Environmental education, science education, youth development, community development
Educational setting	24 non-formal settings, 9 schools
Geographic location	21 urban, 5 rural, 3 suburban, 2 small city, 2 statewide
Geographic region of U.S.	22 Northeast, 5 Southeast, 4 West coast, 2 Midwest

Using a general interview guide with an outline of issues to be explored, the interviewer adapted questions in wording and sequence to specific respondents in the context of the actual interview (Patton 1990). My co-researchers and I conducted thirty-three interviews with professionals (18 female and 15 male; 7 persons of color and 26 white) in 28 different organizations at which point it appeared that saturation in the central concepts of interest had been reached. Practitioners based in New York State were interviewed in person; others were interviewed by telephone. Each interview began with general questions about the individual and her work followed by the telling of a specific success story usually identified by the practitioner. For some, the interviewer requested that the respondent relay the story of the specific project for which they had been selected for inclusion in the research. Throughout, the interviewer posed context-appropriate probes to solicit additional details and encourage the interviewee's reflections on her practice. The interview concluded with questions designed to gather additional perspectives not yet captured. Each interview lasted 33-86 minutes with most lasting about an hour; all but one were audio recorded and transcribed by a

professional clerical assistant. I reviewed transcripts for accuracy with the original recordings, and the transcribed text became the data used for analysis and interpretation. In addition to practitioner interviews, I reviewed program materials, such as newsletters, brochures, annual reports, and web sites.

From interview data and program materials, I identified the forms of environmental action in which practitioners engaged youth by creating a display matrix (Miles and Huberman 1994) with the 28 organizations across one axis and environmental actions down the other. I grouped related actions (e.g., combining “community outreach” and “teaching younger kids” because both involved educating others) to develop the five forms of action presented within. With respect to practitioners’ descriptions of purpose and goals, I first reviewed each interview transcript in its entirety and recorded my perceptions of the interviewee’s articulation of purpose. I then focused analysis more closely on practitioners’ responses to questions about their motivations, goals, and rewards; what they hoped and observed that youth learned; and their perceptions of success. To counter the human cognitive bias toward confirmation (Maxwell 2005), I actively searched transcripts for evidence that would disconfirm the assertions presented within this paper. I particularly looked for evidence that supported purposes of influencing environmental behavior or achieving outcomes of environmental protection and improvement over human development.

Forms of Environmental Action

Before sharing practitioners’ goals, I first discuss the five forms of environmental action in which practitioners described facilitating young people’s participation:

- tangible, physical improvements to the natural or built environment;
- community education and/or teaching younger kids;
- research or inquiry;
- public issue analysis and advocacy for policy change; and
- products or services contributing to community development.

Among these, the first three were most common. Multiple forms of action typically occurred in any given case (Table 2.2). For example, a middle school teacher guided students in research from which they concluded that habitat loss was the primary threat to an endangered butterfly species. The students then chose to work with a local park to tangibly improve the environment by restoring native prairie habitat and afterwards organized an educational festival to teach younger kids about these issues. Chapter 3 illustrates how practitioners and youth, with varying degrees of influence by each, selected and implemented such actions.

In practice, action did not always fulfill the theoretical criteria of being intentional and targeted at root causes. In some cases, youth initiated actions (i.e., intentional) while in others youth had little or no influence in the overall focus of an action project but had a fair amount of leeway in deciding how to approach it within guidelines established by the practitioner (see Chapter 3). Not every action addressed the root causes of an environmental problem; rather, activities and actions were often intertwined. For example, a youth development specialist explained how the activity of regularly removing litter from a community garden (addressing a symptom rather than cause of the problem) led youth to consider whether they might undertake an anti-litter campaign to influence residents to stop littering (i.e., an indirect action directed at the problem's cause, although perhaps not at the root cause of over-

Table 2.2. Forms of environmental action in which practitioners engaged youth. Nearly all practice accounts involved multiple forms.

PROGRAMS (N=28)[1]		**FORMS OF ACTION**				
Educational Setting	Community Context	Physical Improve-ments	Community Education	Inquiry	Advocacy	Community Develop-ment
Non-Formal	Urban	X	X	X	X	X
		X	X	X	X	X
		X	X		X	X
		X	X	X	X	
		X	X	X	X	
		X	X	X	X	
			X	X	X	X
		X	X			X
		X	X	X		
		X	X			
		X		X		
		X		X		
			X	X		
	Rural	X	X	X		X
		X				X
	Regional or statewide	X	X			X
				X	X	
				X		
Formal	Urban	X	X	X	X	
		X	X	X		
		X	X	X		
	Small city	X	X	X	X	
	Suburban	X	X	X		X
		X	X	X		
		X	X	X		
	Rural	X	X	X		
			X	X	X	
		X				X
TOTAL # PROGRAMS		23	22	22	11	10

[1] The 33 practitioners interviewed worked at 28 sites (e.g., community organization, environmental center, school), which I refer to as “programs” for simplicity.

packaging). I describe and provide examples of each form of environmental action below. Many of the examples do not fall purely within one form or another and illustrate the integration of multiple forms within a single project or program (Table 2.2).

Tangible, physical improvements to the environment

In over three-quarters of the 28 programs included in this inquiry, practitioners guided youth in making direct physical improvements, whether small or large, to the natural or built environment. Actions to help protect or restore natural habitats included organizing stream clean-ups, planting trees to stabilize shorelines, removing invasive species, and growing native plants to help restore native ecosystems. Young people also improved built environments by transforming vacant lots into community gardens, painting murals, and planting urban trees.

Community education and/or teaching younger kids

In three-quarters of the programs considered, practitioners guided youth in the indirect action of educating others. Community outreach occurred through public presentations, tours, and demonstrations; community festivals and information fairs; community clean-up days; production of media such as newsletters, brochures, or videos; and participation in public meetings on contested local issues. In three school-based examples, students were central in the development and ongoing operation of environmental education centers. In several examples, middle or high school age youth organized and led educational camps or festivals for elementary age children around topics, such as recycling, water quality, habitat, and wildlife.

Inquiry

In three-quarters of the programs, practitioners engaged youth in primary or secondary research involving social inquiry, issues investigation, environmental monitoring, or experiments in environmental science (see Chapter 5). Most often youth investigated a specific issue of interest through secondary data collection using the Internet and library and asking questions of local experts. Some conducted primary, social inquiry through community assessments, surveys, and mapping. For example, through a community assessment including mapping, store floor diagrams, merchant interviews, and consumer surveys, youth interns at an environmental justice organization discovered that residents desired improvement in the quality of foods available in the neighborhood where less then 5% of the foods sold were fresh produce. Their research led to the creation of a program that provided local merchants with incentives to increase access to healthy foods. Others collected and contributed environmental monitoring data to databases intended for use in state, national, and international scientific studies through programs like Adopt-A-Stream, GLOBE, and Garden Mosaic's Weed Watch. Finally, some conducted their own scientific experiments. For instance, high school students investigating green roofs as a strategy for urban sustainability designed experiments to answer questions, such as "What is the impact of a green roof on heat flow and how might this affect the energy efficiency of a building?" Environmental monitoring and environmental science experiments were most common in school and non-formal science education contexts.

Public issue analysis and advocacy for policy change

In some instances, practitioners guided youth in public issue analysis. For example, high school students investigated water quality issues after learning that their rural community was in violation of its wastewater permit. Through analysis of news articles, participation in city council meetings, discussion with engineers, and fieldwork with the assistance of technical consultants, students learned about complex legal and economic dimensions in addition to gaining knowledge about water quality parameters like nitrates, sediment, and turbidity. Presenting their analysis at a public forum in a neighboring downstream community, students defended their community by explaining the reasons behind the permit violations and demonstrating their own concern for water quality. This case illustrates the teacher's emphasis on developing learners' ability to critically assess a complex environmental issue, because the near-term environmental impact was continued violation of water quality standards. In some cases, practitioners guided youth in advocacy for policy change at the level of the school, neighborhood, municipality, or state. For example, research around air quality and asthma led urban middle school students to advocate for their school district to switch 20% of its bus fleet's fuel from diesel to less-polluting biodiesel. In another case, members of a statewide Youth Conservation Council conducted research and analyzed issues (e.g., diminishing wetlands, environmental impacts of golf courses), developed policy recommendations, and presented them to a state legislative committee.

Products and services contributing to community development

In a handful of examples, practitioners guided young people to provide products or services that contributed to broader community development. For example, youth employed in a sustainable agriculture program grew food organically on 31 acres in a suburban community and thereby helped preserve that town's agricultural heritage and provide fresh produce to residents. They also distributed over 100,000 pounds of food annually to 15 homeless shelters in the larger urban region.

Purposes and Goals Described by Practitioners

Practitioners engaged young people in direct and indirect environmental action in the forms of tangible, physical improvements to the natural or built environment; community education and/or teaching younger kids; secondary data collection and social or scientific inquiry; public issue analysis and advocacy for policy change; and products or services contributing to community development. With this context of what action constituted in mind, I now turn to the question: Toward what ends? What motivated practitioners in terms of goals and purposes to work with youth on environmental issues in their communities?

Interviewees shared a strong faith in the abilities of young people coupled with a passion for the natural environment and/or social justice that they enjoyed sharing with youth. All practitioners described multiple purposes for involving youth in local environmental action. While each conveyed a unique combination of goals, a common theme was evident. *Practitioners sought to realize multiple aims; however, nearly all expressed youth development as the ultimate goal, either in terms of developing young people's*

skills and sense of self, developing youth as citizens, or developing youth as agents of social change. Unlike the predominant EE focus on environmental behavior, these practitioners were more concerned with helping young people develop their capabilities and realize their potential.

Practitioners valued youth development from differing philosophical perspectives. Some spoke only of youth development while others connected youth development with civic participation or a more critically conscious environmental and political education. Below I illustrate with selected excerpts from three practice accounts. Deciding which excerpts to include was no easy task because I could have chosen many, each interweaving multiple goals but with its own unique facets. The excerpts below illustrate the integration of multiple goals with varying degrees of emphasis on developing youth more generally, developing citizens, or developing social change agents. Collectively, this set of excerpts also conveys many, although not all, of the purpose-related themes identified across interviews. In introducing each excerpt below, I further explain my rationale for its inclusion.

Developing young people's skills and sense of self

In this excerpt, the manager of an after-school youth development program in a rural community discussed the purposes that motivated her to facilitate a project in which seven 6th to 8th grade students meeting once a week over the course of 8 months produced a digital "Green Homes" video that documented local residents' experiences renovating or building homes with environmental sustainability in mind. The video debuted at a community screening and was then made available for loan through the county's Cooperative Extension office. Designed to educate others, the video project

involved environmental action in the forms of social inquiry (youth developed questions and interviewed homeowners to learn about their perspectives on and experiences with green building) and community education.

I selected this excerpt because the description of her motivation to work on environmental issues with youth reflects the tension within EE goals related to environmental and participation outcomes. This program manager clearly articulated a desire to influence learners' individual lifestyles to be more environmentally friendly; however, she also expressed a strong desire to encourage young people's own expression and self-determination.

> I care a lot about environmental issues and I think the real work of saving the world is learning to work with other people and to be able to produce and do for yourself what you want in spite of all our differences and our disagreements. And I feel like people really need to be on the same page as far as our environment, and right now we're not, so any experience that kids have that's fun, I think is really positive because activism should never be an obligation or a drag. Whatever you end up doing should be an expression of the joy that you find in being alive and being yourself. … Since I work in a school, I think that a lot of the necessary structure in the school is also stifling for people's true selves and the expression of who they really are and their basic belief, so one thing I'm really passionate about is helping them to have the chance to express themselves without being stifled by social conventions or dumb rules …
>
> Making a project that's about the environment and teaching kids about the impacts of choices, as far as what consumers can choose to buy for their building or their energy choices, those choices really matter and if everyone made different choices, the world would be really different. … So just giving them an experience where they're thinking about all these things and they're doing something that's really fun. The video is definitely the hook for them … they just love anything with movies so it doesn't really matter what the topic is. We can do a documentary about anything and they would be into it because it's fun to make movies. I just think it's important that we all learn about this stuff and they're young, so now is a good time because they're forming their values.
>
> [The purpose of the project is] to give the kids a chance to create something really substantial … to make a video that hopefully will teach other people about green building, at least an introduction if they don't

> know that much about it. And hopefully to show other kids what kids are capable of doing. Because the kids are going to be really obvious in the movie. [They] filmed [one another] doing introductions, so it will be clear that it was a movie produced by kids. … I would hope that the kids at the end would have an understanding of what green building is about and they would feel friendly towards it at least and they would be aware of what it means … I hope they'll learn how to use cameras. What it means to be involved in a really long-term project with lots of delayed gratification that is not finished for a long time. And it's always my hope that they will learn something about the power of the media … And my personality is really project oriented, so I want to finish and I want this to be a nice video that we can show people that they will get something out of.
>
> The goals of [my organization] are to promote positive youth development, so it relates really well because the kids are in charge of a lot of this and they're making decisions and they're getting to have experiences that they wouldn't otherwise like using [video] cameras ... And they are also developing positive relationships with me and [my colleague], which is another part of the program, to be kind of a mentoring figure.

From the above, we see that the action project, in this case making an educational movie, was a vehicle or the "hook" for raising young people's awareness of environmental issues and encouraging them to consider their own environmental impact. The goals of the project, however, encompassed much more than environmental learning and included teamwork, self-expression, video production skills, decision-making, and developing positive relationships with adults. This multi-faceted view of the purpose for engaging youth in environmental action was also evident as this practitioner discussed success. Like several other interviewees, when asked to share a specific example of success, this practitioner told the story of an individual participant. This success, small in scale yet powerful in affect, interestingly involved no environmental outcome.

> At one of the houses that we filmed, the people had two kids and they went upstairs when we got there. And one of the [girls participating in the project], she decided after we had filmed and interviewed the homeowner, she decided she wanted to film the kid and interview him

> because she said whenever her dad has people over she has to go upstairs so she thought that he was upstairs because we were there and we were guests and he had to be out of the way. So she decided she wanted to interview him and ask him questions and that was really touching. That was really powerful. And so she kind of organized this interview … and that was really great because she saw something that she felt was unjust so she was taking steps to correct it.

The above emphasis on youth development is not surprising given that this practitioner was a youth development program manager; however, building young people's skills (e.g., self-sufficiency, communication, organization, teamwork, entrepreneurship, time management, problem solving, analysis, critical thinking) and helping youth to develop "voice" and realize their potential were goals also frequently expressed by others working in diverse contexts (e.g., environmental justice activists, urban agriculture educators, environmental science teachers).

Developing citizens

The next excerpt comes from the account of a science teacher at a suburban middle school. He involved students in his science classes in restoration of a local nature preserve that was a globally rare ecosystem. In addition, he coordinated a summer program in which 60 students volunteered annually. After receiving training, the students managed butterfly gardens, raised butterflies for release to the wild, provided public tours of the butterfly facility, and organized and led a day camp for younger children. This project involved environmental action in the forms of physical improvements, scientific inquiry, community education, and teaching younger kids.

I selected this excerpt because it provides an excellent example of the integration of scientific inquiry and community action (see Chapter 5) and also reflects a sentiment common among science educators in both schools and

non-formal settings that environmental action makes learning science meaningful and relevant to young people's lives. Clearly, however, the project had much broader purpose and impact as illustrated below.

> [This project]allows me a forum to make their learning meaningful. I firmly believe that. I can teach bookwork but it doesn't make it real and this has allowed me to create a living laboratory. A place where kids can experiment, where we can experiment and it's teaching science as science. Not just modeling science but actually doing science. So I think that's the key. From the first day I got to the school, we knew that inquiry and scientific investigation was the way to teach science. … But this now gave me an opportunity to bring that to an outdoor area, an outdoor classroom and show the kids that all the techniques they learned about designing and controlling an experiment are what we really do and what scientists have to really do. And so that's the main reason. It's allowed me to teach science as science rather than just cookbook or content knowledge.
>
> [The project has] many, many, many purposes. Probably on the first level it's an application of all of the students' concepts and knowledge on ecology to a real life ecosystem. So after they've learned ecology they get to apply everything they learned in the real world. We talk a lot about relationships, abiotic factors, and instead of being book oriented or tropical rainforest, which unfortunately they never see, they get to apply it to the land right next to them.
>
> We've also linked their work to actual science research. So the kids are actually real researchers. They can produce reports that are usable by other scientists in this area. … We did a tremendous experiment on the scarification of lupine seeds. We sent to the top ten experts in the country on lupine and got eight different ways to scarify. And so the kids ran the eight experiments and concluded which method was best for scarification. And we presented that data back to the scientists. So those are real life, real value experiments that we do.
>
> We've also built in a large community service component. The students are active restoration agents. They work to restore the ecosystem. So they are actually making a change in the world they live in. That builds tremendous self-esteem and also the amount of work they do does make an actual change. It's not token, it's not like just picking up litter, which is not bad, but it also lets them make a change. … They're changing and they're preserving a globally rare ecosystem. … Learning that yes you can make a difference in your world. Even if you just girdle ten [invasive] trees, if 100 students girdle 10 trees, then we have 1000. … And if you do it for ten years all of a sudden you've made a change

> in the world so I think it's an empowerment that yes you make a small change but it's part of a bigger change. So the service learning is very important. The idea of service linking to other service, I'm hoping that kids will see that they can do these sorts of things in regard to other issues or other areas also.
>
> Also a lot of it is goodwill. The whole summer program is basically generated to make community members more aware of what we're doing and what the [ecosystem] is so that they can make more intelligent decisions in the future about [it]. Also the kids, they know what it is so they can make better decisions when they become citizens to vote.

Like this science teacher, several practitioners hoped that youth would develop skills and a commitment to community service that would be transferable to other parts of their lives. They spoke of preparing youth for future roles as voters who think critically about issues and as citizens committed to serving their community. For these practitioners, many of whom worked in youth development or science education contexts, the youth development goals of environmental action related to a democratic aim of developing citizens who would be capable participants in their communities, whether in environmental or other arenas.

The same teacher's reflections below on the success of the summer program demonstrate that young people's actions contributed to substantial environmental impact; yet success involved many facets of which environmental outcomes were only one component.

> Well it's our 8th year. We've had over 20,000 people come through our doors. We have tremendous amount of visitors repeat. We've had people from, not only all over the country but international people come because they've heard about it. We've had people from the State Entomology Department come and actually praise us on our care of our caterpillars. We've released hundreds of Monarchs back to Mexico. We've probably bred many thousands of butterflies and released them into the wild. I think that students volunteering year after year after year shows that they find it worthwhile. The amount of parent feedback we get is unbelievable. And it's 99.99% positive. I think that we've grown to include all of the younger students. We now have an organic garden

> that we also work with. We also go to a nursing home and maintain a garden for them at a nursing home. … And as I often say to people, people think they're coming here to see the butterflies but what most people comment when they leave is not about the butterflies but is about the students. The poise that the students show, the knowledge that the students show and basically … how well the students present themselves to the general public. Because kids often get a bad rap as to being teenagers and I think that's because people don't see this side of the kids. And so we're really not showing butterflies, we're really showing kids.

Developing social change agents

The final excerpt is from the story of a program coordinator that led after-school and summer programs for youth at a community-based organization in an inner-city neighborhood. Through a gardening program, he engaged youth in several forms of action: physical improvements (transforming a vacant lot into a community garden); social inquiry (community mapping and neighborhood nutrition survey); community education (informational health fairs); advocacy (petition drives and speaking at local council meetings in favor of preserving their garden); and community development (growing produce for a community kitchen and thereby increasing access to fresh, healthy foods). This program coordinator clearly articulated a long-term goal of “sustainable community development,” as did many other practitioners who envisioned the tangible products of environmental action and the development of youth as citizens or change agents contributing to more environmentally sustainable and socially just communities.

> As an environmental initiative, it’s part of a larger rubric that I work with, which is sustainable community development, that’s what gets my juices flowing. And what better place to carry out, if you will an experiment in sustainable development? ... Why do I say that? Because [this neighborhood] is in the midst of a tremendous gentrification boom. You could call it economic development boom, and there are all kinds

> of euphemisms that we could attach to it, but essentially there is a lot of uprooting of what could otherwise go towards community open space cultivation, which really goes towards promoting the quality of life in the community. There is a relationship between the physical character of the community and how people feel about themselves, how they interact with their community peers. It's like we went from one extreme to the other. We went from an extreme – here in this community – for many years, a lot of abandonment of property and dilapidated buildings and being taken over by vermin and drug activity, to the other extreme, which is this explosion of development that's occurring. And in both cases, where has the community been – that is to say, the indigenous population – in terms of really having a hand in what goes on in the community? Sustainable development for me assumes that there is an indigenous stakeholdership in what happens in the community.

In working toward his vision of sustainable community development, this practitioner also described multiple goals.

> [The purpose of the gardening program is] to provide an opportunity for the empowerment of young people, vis-à-vis gardening work, and vis-à-vis some of the things like providing food for the local community. So empowerment through social responsibility … Programming where young people are recognized for real contributions that they're making. … Gardening work is a beautiful vehicle for learning process and appreciating process. And the big payoff is the results that you get during harvest and knowing what it took to get to that point. And that's extremely, how should I say this? Extremely affirming of an individual's sense of personal efficacy. … We deal with, to be sure, [this organization] is predicated upon addressing the needs of an at-risk population of youth and their families, so we are situated in a community with a lot of needs, and I think part of the power of something like [this program] is that it demonstrates that you can really address some of the personal growth and development needs of youth that are at risk, because we have been able to hold onto a cadre of young people who have been with me [for two years], and certainly through this project who have really developed an increasingly steady, wholesome sense of themselves and self esteem.
>
> We are trying to take a break from, as one of my kids, would say, we're trying to take a break from the chaos, trying to take a break from what's going on out in the street, which is a day-to-day reality for them, and trying to provide a sense that you can embrace alternatives for your life. I mean this is the sort of thing that keeps them from going over that edge and saying, "Well, let me just join the gang." Because I definitely have those students here and some of them are pretty scary. I had a kid that – won't mention any names, but one kid was suspended here, indefinitely, from this center, because she was just like – if kids didn't do

> right by her, she damn near put a kid's head through the wall, a kid that was bothering her. I mean she had cause, but this is the level of the edge that they're living on.
>
> When you don't have a continuity of humanizing relationships, that in itself is a precursor to violence. And it just plays itself out. Gardening gives you an opportunity to be productive, to be recognized for being productive, it gives you the opportunity to be part of a team, it gives you an opportunity to be recognized for those efforts vis-à-vis the process, the harvesting and all of that. By its very nature of nurturing the growth of plants, it is very humanizing. And just the overall environment, the green space of the garden, just has a very calming effect. And our young people have said as much …

In this excerpt, the youth development dimensions of environmental action – such as humanizing relationships, productivity, and recognition – assume magnified meaning given the challenging life circumstances faced by youth in this community. Like other community organizers working in impoverished, marginalized neighborhoods, this practitioner also explicitly aimed to empower youth to change oppressive structures of the dominant social system that contribute to these conditions in their community.

> You need to have folks that have a vision … something that you're not gonna have happen right away, but something that sustains you through the grunt work of it all. You just have to really have an overarching sense of vision. For me, it's sustainable community development, and the fact that I am helping to empower young people through developing working models, and that they are playing an integral role in that. At the training last year, I distinctly remember saying, "MY work is to empower young people to be change agents" – that's the term I used, to be change agents – "in their community." That's what keeps me going.

As in the other two interviews, this program coordinator described multiple purposes for engaging youth in action and emphasized youth development as an important goal. Unlike the others, this excerpt reflects a greater degree of political education and a goal of developing young people's critical consciousness and capabilities as social change agents. Empowering youth to participate in social change was a goal most common among

practitioners working in poor, urban, African-American or Latino neighborhoods, although a few working in other contexts also expressed it. These practitioners more often than others engaged youth in environmental action connected to broader community development goals, for example by researching models of cooperative home ownership as part of an anti-displacement campaign in a rapidly gentrifying neighborhood.

Multiple goals, multiple dimensions of success

While interviewees described multiple purposes motivating their work with young people, all emphasized human development as an important if not the ultimate purpose in their practice.

> This type of process when you're working with young people takes longer and that's why I say the end is not the product, it's the process.
> – Director, community organization

> There's a whole different dimension to it in terms of how you're helping shape their understanding of the world and their sense of being able to act in it and I think in some ways that is more important than the … projects that we get out of it at the end.
> – Coordinator, action research program

Practitioners' beliefs that developing youth through the *process* of environmental action was more important than the *product* in terms of tangible environmental change corresponded with descriptions of success that placed greater value on dimensions like youth expression and empowerment than more readily measurable outcomes, such as the amount of habitat restored or number of community members attending a youth-led public education program. Practitioners' success stories illustrated that youth participation in environmental action can lead to many positive, and sometimes unexpected, outcomes that are meaningful beyond the realm of the environment (Table 2.3).

Table 2.3. Evidence of success reported by interviewees. Practitioners described environmental action projects as successful in terms of resulting environmental change, growth of youth participants in myriad ways, and positive influences on other community members.

Evidence of success reported by practitioners	**Examples**
Positive environmental change	One acre restored to native prairie School with a food-producing garden Working butterfly house and native plant sanctuary
Youth enthusiasm and continued participation	… right now I have 30 kids and 24 of them are on their own in the evening going to a different school in the district and doing a 15 minute presentation on bio-diesel. And so there's no grade for that and some of the kids are just, they won't speak in class they're so shy, and they're volunteering to go off and do this. And so the different aspects of participation are probably the best informal assessment that we have.
Youth experiencing a sense of calm in "nature"	Well there's one little moment that I really remember all the time. There was a student who … as soon as she came out [into the garden] … she just took this big breath and she's like, "Oh." And then, we were leaving actually and she just took a big breath and she's like, "I feel so much better now than I did when class started." … And I just remember feeling like, "Oh this is worth it you know."
Improved academic performance	… on the test scores, when they were divided up into different sections, like ecology and genetics and cells … and the kids did really well on the tests in the ecology section because of what we did.
Youth developing confidence as public speakers	… watching them coming in at 14 years old being totally quiet, being really scared of doing anything that had to do with public speaking or being around people period and then holding their own in front of an audience, that's growth, you know what I mean?
Youth mastering subject matter	And then some of them, it just turned them on, [doing] a Tree ID Quiz every morning, they realized they really liked doing that and … they could develop mastery of something and they gained confidence in that. So, of course … their body language tells me that they're ready to go somewhere else. And then their parents say, "I can't get him to shut-up about all the different trees and what condition they're in and what they are."
Youth exhibiting pride in their accomplishments	… well it started out the youth … really got bored fast with the business plan, like writing it and going through all that. ... But then we had one of the women who takes clients at the small business development center, and she came and they gave her a huge presentation and they knew everything about business planning before she even said it. She was like, "Do you know this?" And they're like, "Oh yeah, this is our marketing strategy and blah, blah, blah, blah, blah," and she was just like, "Oh wow, you guys don't need me at all." And they really were proud of themselves about that. And I think there was a sense of accomplishment felt there that they really realized how much they knew.

Table 2.3. (continued)

Evidence of success reported by practitioners	**Examples**
Breaking down stereotypes – youth viewing themselves and others in new light	The teamwork, the way the students bonded, we broke down the geo-centricity of high school … in a district like [ours], everybody has kind of stereotyped themselves. I go to Washington, so I'm not as smart as the guy who goes to Jefferson. And they found out that isn't true … they start seeing maybe those stereotypes are wrong of themselves and of the other schools. And I think that was a real important step for a lot of the kids. Our current group of students are just remarkable at how well they've bonded across lines.
Life paths chosen by participants (e.g., college, jobs, volunteerism)	… I've seen young people that I've had since I was here … that are now going away to college. When I first talked to them about college they were like “no, no, no” and then just by showing them that there's scholarship opportunities … and just really talking about this as very realistic … and explaining to them how I did it, how I paid my own way through school and how I got loans I'm still paying off and how I learned how to use the FAFSA system … and how I applied for scholarships and applied for grants and how these things can be realistic for them to support themselves and go to college, even though it's hard that there are people who do it, and so when you actually see … young people have scholarships and they're going away to a university, to me that's a powerful affect.
Adults receiving youth input	And they bring such a different perspective, it’s a creative one, and giving them a chance in a well thought out forum to share that with us is really critical. The [youth] made observations that were the same ones we've made forever. So it was kind of validating to have them talk about things that we have been thinking of. But they also came up with some observations that surprised us …
Unexpected recognition for a community partner	I nominated him for the public works employee of the year to Keep Georgia Beautiful and last year he won first place in the state … this person never expected something like that, so he and his mother got to come to Atlanta with us and his mother had never even been to Atlanta and … she had never been out of [our small town] … it just has been a very big positive community impact with a lot of good recognition, not just for the students but for other people that have been willing to work with the kids too.
Influencing others to engage in sustainability issues	… the whole class is a success in the sense that I think it is functioning as a locus for change at a school-wide community level.

Integrating Practice and Theory: Developing Democratic Citizens through Environmental Action

Practitioners engaging youth in action around a variety of environmental issues in diverse programmatic and community contexts expressed multiple, interconnected goals motivating their work. Most, however, articulated their ultimate purpose as the development of participating youth. While the restored habitat, reclaimed vacant lot, or educational festival around water quality is undoubtedly a valued outcome, perhaps of greatest value from an educational perspective is not the environmental action but rather the dimension of participation inherent within it (see Chapter 3). The development of young people as citizens or change agents, in addition to the concrete products of environmental action (e.g., increased access to organic produce, improved stream quality), contributed to practitioners' longer-term visions of environmentally sustainable and socially just communities.

This emphasis on human development is consistent with the educational ideal of action competence – the capability based on critical thinking to engage with others in actions for a more humane world – described by scholars (Jensen and Schnack 1997). As one environmental educator said of the students with whom he worked, "… they grow in their confidence as citizens capable of constructive action." Integrating theoretical and practitioner perspectives, one can envision a simplified model that relates young people's participation in environmental action to the development of competence as democratic citizens (Figure 2.1). Figure 2.1 illustrates a positive feedback loop in that the experience of participating in environmental action enhances learners' capabilities for further participation in environmental (possibly) and other valued spheres of life.

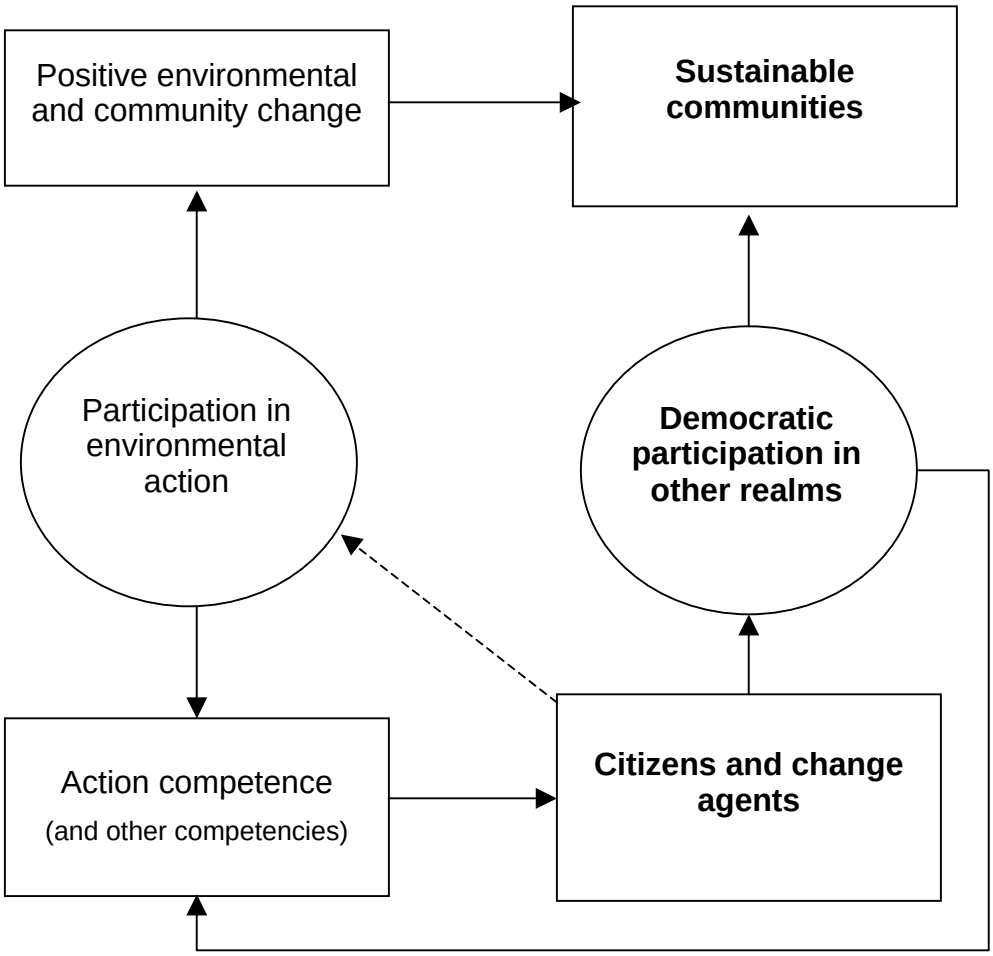

Figure 2.1. A simplified model integrating theoretical and practitioner perspectives in which the experience of participating in environmental action enhances learners' competence to participate as a citizen in other valued spheres of life.

Figure 2.1 is consistent with the educative function of participation in participatory democracy. Pateman's (1970: 42) analysis of democratic theories concluded that a major function of participation in the theory of participatory democracy is educative: "Participation develops and fosters the very qualities necessary for it; the more individuals participate the better they become able to do so." Similarly, Freire (1973) stated that people learn democracy through

the exercise of democracy. This model is also consistent with Dewey's theory that education comes about through experience, which is the result of a transaction between an individual and his environment. An experience both builds on the learners' prior experiences and modifies the quality of experiences to come (Dewey 1938). Not all experiences of environmental action are educational, however (Jensen and Schnack 1997). An experience is mis-educative when it arrests or distorts the growth of further experience (Dewey 1938).

Implications for EE Research

Understanding developed through interpretation of practice accounts has three broad implications for EE research. First are opportunities for research that reflect EE's full educational potential. Second is intentionally reflecting on values in EE and research practice. Third is taking a systems approach through research that explores relationships among individuals and communities as well as environmental sustainability and community development. I explain each of these below.

A more holistic perspective for EE

When research concerns environmental behavior change, it misses a host of other possible outcomes. For example, Volk and Cheak (2003) documented that participation in school-based environmental inquiry and action in a Hawaiian community enhanced students' critical thinking skills; citizenship competence; reading, writing, and oral communication skills; familiarity with technology; and self-confidence. The practitioners that I interviewed clearly aimed for outcomes beyond changes in learners'

environmental behaviors. Their practice warrants research that assesses EE's contributions toward young people's development of self-expression, sense of personal efficacy, positive relationships with adults and peers, and a host of other assets that promote an individual's well-being (Eccles and Gootman 2002, see Chapter 4).

More specifically, inquiring how environmental action contributes to the development of democratic citizens offers rich opportunity for EE research. A primary task is further developing understanding of action competence and its dimensions (i.e., knowledge, commitment, visions, action experiences, and perhaps others). Although Jensen and Schnack (1997) proposed the concept over a decade ago, its development is still in its infancy. Researchers have explored types of knowledge contributing to action competence (Jensen 2000, 2002) and its relationship to critical thinking (Mogensen 1997) and social capital (Colquhoun 2000, Fien and Skoien 2002) but much remains to learn about action competence and its relationship to citizenship development and environmental and social change. Also poorly understood is the suitability of action competence as an educational aim in different cultures, as Csobod (2000) explored in Hungary's transition from a state socialist system to a democratic, market economy system, for example. Furthermore, investigating characteristics of the educational practices (see Chapters 3 and 4) and settings (Chawla and Heft 2002) that support or impede the development of action competence is another area ripe for rigorous and innovative EE research.

Reflexivity about values

Some might fear that an action-oriented approach to EE runs the risk of indoctrination; however, I believe that the opposite is true. Action that involves genuine participation – rather than manipulation, decoration, or tokenism (Hart 1997) – and critical reflection (Schusler and Krasny 2007) provides opportunity for explicit discussion about values, which is key to helping youth develop their own values consistent with their understanding of the world and their relationship to it. Some educators will be uncomfortable discussing values with learners. For example, collaborating with teachers to initiate environmental action projects with students at five senior high schools in Switzerland, Kyburz-Graber (1999:430) discovered that initially "… teachers believed that it was important not to talk about values in order to avoid ideological indoctrination of students." The argument for maintaining "objectivity" about environmental topics in schools has proved problematic, however, because no one is value free (Disinger 2001), and "education is an inherently value-laden endeavor" (Jickling 2003:22).

Educational practice involves a collection of different activities undertaken toward some unifying purpose and embodies values and beliefs about what is worthwhile learning and how learning should be pursued (Pring 2000). In addition to pursuing explicit curricular aims, educators convey important messages through what they do in an educational setting – the implicit curriculum – and what they leave out of their instruction – the null curriculum (Eisner in Jickling 2003). Jickling provided this example: "… if we want students to participate effectively in a democracy yet we run authoritarian classrooms, then our implicit curriculum works against our aims, and we reveal

much about our values. It is hard to imagine how anyone can be readied for democratic participation in such a hostile environment" (Jickling 2003:22).

Hart (2003) discussed the moral dimensions of teaching and concluded that:

> … despite different conceptions of the moral, teaching, by definition, means promoting enabling attitudes and beliefs to grow in both intellectual and moral terms, by engaging [students] in thinking through controversial issues rather than avoiding them. … The presumption is that teachers should not practice in ways that convey singled-minded advocacy of particular ideologies or sets of values, to socialize or enculturate students into particular ways of thinking about social issues and problems. This does not imply, however that teachers should not encourage students to look beyond established mores or extant beliefs or values, not necessarily with an eye on rejecting those values or mores, but rather with the hope of understanding their strengths and weaknesses against a backdrop broader than they themselves are capable of providing (Hart 2003: 206).

Hart and colleagues (2003) observed that environmental educators in Canadian elementary schools provided opening for criticism, questioning, debate, and dialogue, thereby involving multiple voices in conversations around controversial environmental issues.

Environmental action affords opportunity for learners to explore values by participating in the creation of alternative visions for society rather than passively accepting values prescribed by either the dominant system or a specific alternative paradigm (Jickling 2003). In this inquiry, several practitioners (some in schools, more in community organizations) described striving to create open, respectful learning environments that would enable young people's reflection on values. This is a challenging task because power relationships between educators and learners are often unbalanced, and learners might not possess the necessary insight, knowledge, understanding, or courage to respond effectively to their elders' influence (Jickling 2003). I have come to believe that managing this tension between young people's

autonomy and educator authority is a primary challenge and essential skill for facilitating youth participation in environmental action (see Chapter 3).

As EE researchers, how can we be more reflexive about our own values and their influence on our research practice? And how can we encourage practitioners' reflexivity as well? Hart (2000) advised that researchers take care not to reduce the complexity of the lived experience of teaching-learning contexts. He argued that the complex connection between teachers' values and children's social and environmental consciousness requires naturalistic, phenomenological inquiries which attempt to understand teacher thinking and children's ideas from their own points of view (Hart 2000). A related approach is to conduct participatory research with practitioners and youth (Kirshner et al. 2005) that also reflects their values and purposes in the research undertaken.

A systems approach

Reflecting on the forces contributing to the success of a community organization engaging youth in sustainable agriculture, a program director said:

> … we have a holistic, integrated, probing, innovative vision that people tend to find pretty intriguing because we don't describe our work as working on problems or needs … we tend to think of ourselves as charting out a purpose with a diverse community of youth to achieve a lot of healthy outcomes … this is about fitness and nutrition, this is about obesity, this is about economic development, this is about land preservation, this is about feeding the hungry people in our community, this is about youth development … so we have like 15 different things we're doing in our system … we have an exciting multi-pronged vision.

This particular case was one of the most holistic examples; however, in every case, multiple initiatives occurred simultaneously – for example, environmental education and youth development; science education, service learning, and

youth development; urban greening, health education, youth development, and community development. Moving beyond school walls, teachers involved youth in projects working with and contributing to their community (Yoder and Maine 2000). Community organizers involved youth in environmental action as one component of socially just community and economic development. Practitioners' holistic, integrated approach calls for research that also takes a systems approach.

Krasny and Tidball (In review) describe a social-ecological systems approach to EE in cities called Civic Ecology Education. Encompassing principles of diversity, participation, and adaptive learning, this approach builds on individual, social, and natural assets present in a community, and it contributes to community resilience and sustainability. They propose that research should look at individual and community level impacts, and the feedback loops that are created when EE programs draw from and contribute to community assets and resilience. This inquiry also suggests that environmental action contributes to multiple impacts at individual and community levels; yet, little is understood about how this occurs. What can be learned through research exploring the relationships implied by the arrows in Figure 2.1? How do young people's actions contribute to community impacts? How does contributing to community impacts through environmental action develop young people's competence as citizens? These are fundamental questions for EE research.

Conclusion

Despite critiques of EE that assumes a deterministic educational role (Jickling 1992, Jickling and Spork 1998) and neglects to consider the broader historical, economic, social, and political constraints on environmental improvement (Robottom and Hart 1995), EE research continues to focus predominantly on education as a means to influence individual, environmental behaviors. Practitioners in this inquiry, who engaged youth in direct and indirect action addressing a range of environmental issues in diverse programmatic and community contexts, expressed much richer, multi-faceted, holistic purposes motivating their educational practice than those typically considered by EE researchers. Young people's tangible contributions to positive environmental and community change were an evident measure of success in practitioners' narratives of environmental action; however, practitioners cared more about the human development of participating youth. The words of a community organizer who guided urban youth in action around community gardening and urban greening echoed the sentiment of many others. He said, "We've been able to harvest more than just collard greens out of the garden, you know."

CHAPTER 3

YOUTH-ADULT PARTNERSHIPS CREATING POSITIVE ENVIRONMENTAL CHANGE

Young people's contributions to positive environmental change in their communities have been documented across the globe (Hart 1997). Although not commonplace, inspirational examples exist in the U.S. of youth participation in action improving both natural and built environments, while at the same time helping youth grow as citizens (see Chapter 2). Such examples generally do not involve youth acting entirely on their own. Rather, a teacher, community organizer, youth development specialist or other adult leader facilitates young people's participation.

The practice of these adults is of interest because its participatory character is counter to common practice in U.S. schools (Resnick 1987, Apple 2007) and many youth programs (P/PV 2000). For example, most science teachers are not collaborating with a local natural resource management agency to involve their students in scientific experiments designed to inform the restoration of a native ecosystem. Nor are many youth development specialists or community organizers integrating youth in an intergenerational approach to community development that addresses concurrently environmental, economic, and social justice issues (see Chapter 2). Thus, what we can learn from the atypical practitioner who is engaging young people in real, meaningful action to improve local environments and communities is of interest because it can inform others who want to simultaneously achieve goals of youth development and environmental change. To that end, I undertook interpretive, interview-based inquiry with practitioners engaging

youth in environmental action in diverse programmatic and community contexts.

Through interpretation of practice accounts, I came to understand three essential themes. First, as I have described elsewhere, I came to recognize environmental action as a valuable context for positive youth development (see Chapter 4) and the integration of individual and community development goals (see Chapter 2). Second, I came to view this phenomenon as a partnership involving youth and adults with defining characteristics of mutual learning and shared decision-making. Third, I came to appreciate that central in the adult experience of sharing decision-making power with youth is a tension between encouraging youth autonomy and maintaining practitioner authority. In this paper, I describe how I came to understand examples of youth participation in environmental action as youth adult-partnerships within which adults experienced tensions in sharing decision-making power. I begin by situating this inquiry within theory of participatory democracy and youth participation. I then describe the methodology. Next I draw upon practice stories and additional areas of literature to discuss the themes of youth-adult partnership, tensions within shared decision-making, and implications for participatory educational practice.

Youth Participation in Environmental Action

Within the contested domain of democratic theory, participatory democracy envisions a broader function of participation than selecting political leaders through the electoral process. Participation in decision-making at various institutional levels (e.g., workplace, school, community) develops a citizen's attitude and capacity for the participation required by national

representative institutions and other societal spheres (Pateman 1970). In this view, participation serves an *educative* as well as an instrumental function. People learn to participate in a democracy through the exercise of democracy (Freire 1973). This educative function provides justification for a participatory approach to education that engages young people in community issues, thereby developing future citizens. In addition, some scholars argue that children have current rights and responsibilities as citizens (Hanna 1936, de Winter 1997, Hart 1997, Eames-Sheavly 1999, Chawla and Heft 2002, Driskell 2002). This view is consistent with the U.N. Convention on the Rights of the Child (UN 1989), although the U.S. is not a ratifying party. Whether in the development of future citizens or the exercise of current rights and responsibilities, young people's participation can contribute to both individual and community development (see Chapter 2).

Hart (1997) described forms of youth participation varying in the degree of young people's power to make decisions and affect change. Driskell (2002) included a second dimension of youth participation: the degree of interaction and collaboration with the community. Non-participation in the forms of manipulation, decoration, and tokenism has the appearance of youth participation but in reality adults are using young people to promote their own agendas. Models of genuine participation include consultation, social mobilization, children-in-charge, and shared decision-making whether a project is youth or adult-initiated (Hart 1997, Driskell 2002) (Table 3.1). One form of participation is not necessarily better than another; rather, the different forms create different opportunities for young people to participate as they choose to the extent of their capabilities and interests. Also, different forms of participation might be more or less suitable in different cultures (Hart 1997). In

practice, forms of youth participation vary not only among different programs or projects but also within different components of a particular program or during different stages of a project's evolution (Driskell 2002).

Table 3.1. Forms of youth participation (Hart 1997, Driskell 2002).

Consultation	Description: Adult decision-makers ask youth for their ideas and perspectives and give young people's opinions serious consideration in making decisions. Can slip into realm of non-participation if youth perspective is solicited but not seriously considered. Youth decision-making influence: High if opinions truly considered by adults. Youth interaction with community: Low. Example: Youth give opinions about their city as part of a survey that informs adult decision-making.
Social mobilization	Description: Youth are involved in carrying out a program initially determined by adults. Can slip into realm of non-participation if youth are not adequately informed about what they are doing and why nor given opportunity to affect the project's process or outcomes. Can support meaningful participation if youth are adequately informed, participation is voluntary, and youth ideas and opinions are reflected in project decisions and outcomes. (The latter could be described as adult-initiated, shared decision-making). Youth decision-making influence: Low. Youth interaction with community: High. Example: Youth involved in an adult-initiated community education campaign.
Child-in-charge	Description: Youth initiate an activity, make decisions, and determine outcomes. Youth decision-making influence: High. Youth interaction with community: Low. Example: A child-made clubhouse in an empty plot of land.
Shared decision-making	Description: When youth and adults collaborate in decision-making, planning, and implementation throughout the project's process. Can be initiated by youth or adults. Youth decision-making influence: Varies depending on whether adult or child-initiated. Youth interaction with community: Varies. Example: Youth-adult partnerships engaged in environmental action described within this paper.

This inquiry specifically explored the experience of shared decision-making from the perspective of practitioners who facilitated youth participation in local environmental action. It provides insights into poorly understood aspects of youth participation, including the roles that adults play in supporting youth participation (Cahill and Hart 2006) and tensions related to adult roles and young people's freedom (Clark and Percy-Smith 2006). My focus on practitioners' perspectives is not to discount the perspectives of youth. I chose to focus the inquiry in this way because I believe that learning from these practitioners' experiences can enhance theory and inform other professionals who in positions as environmental educators, teachers, non-formal science educators, youth development specialists, or community organizers might also choose to share project, program, or organizational decision-making power with young people.

Emmons (1997) defined environmental action as a deliberate strategy involving decisions, planning, implementation, and reflection by an individual or group that intends to achieve a specific environmental outcome. Examples of environmental action include persuading local government officials to implement erosion control along a stream bank in response to water quality testing that revealed high levels of sediment (Tompkins 2005), or reclaiming a city lot for a vegetable garden and growing produce for a local community kitchen (Figueroa 2003). Environmental action as an educational approach aims to develop young people's critical thinking and the understanding, motivation, and skills to act on their values (Jensen and Schnack 1997, see Chapter 2). This might mean that a learner chooses not to act, or to act counter to environmental protection; what is important is that the learner

develops the ability to critically assess a situation and act based upon his or her assessment, interests, and values.

While environmental action projects are not always successful and these experiences are more meaningful for some participating youth than others (Schusler and Krasny 2007), several benefits have been associated with youth participation in local environmental action. Because these experiences often involve characteristics of settings that promote positive youth development (see Chapter 4), they can contribute to young people's development of personal and social assets (e.g., confidence in one's personal efficacy, connectedness with peers and adults) that promote well-being (Eccles and Gootman 2002). Community-based environmental management offers a context for science education in which youth participate in the social negotiations that produce knowledge relevant to community decisions and actions (Fusco and Barton 2001, Roth and Lee 2004). Young people's positive contributions to environmental management, neighborhood planning, and community development have been documented around the world (Hart 1997, Adams and Ingham 1998, Ross and Coleman 2000, Chawla 2002). Finally, young people's contributions through environmental action might contribute to more positive perceptions of youth on the part of adults, as research conducted in the context of youth governance has demonstrated (Zeldin et al. 2000, Zeldin 2004).

Curricula and program materials offer guidance on how to proceed in an action project with youth; however, from my own experience I believe that facilitating youth participation in local environmental action is much more nuanced and complex than evident from these materials. Some useful references integrating theory and practice exist (e.g., Hart 1997, Driskell

2002); however, the role of practitioners in creating opportunities for youth participation in environmental action is often vague or altogether missing in popular and scholarly literature. Some practitioners seem to be “naturals” at engaging and empowering youth but little systematic analysis has addressed how they do it (P/PV 2000). Thus, I undertook interpretive, interview-based research to help fill this void in understanding about the experiences of practitioners who facilitated youth participation in the creation of positive environmental change in their communities. This inquiry contributes to a small but growing body of research exploring the practice of environmental educators (Kyburz-Graber 1999, Hart 2003, Lewis 2004). While others have focused on teachers, this inquiry also included practitioners working in diverse non-formal educational settings (Table 3.2).

Methodology

I chose a phenomenological approach because my interest was in understanding youth participation in environmental action from the perspectives of practitioners facilitating it. Phenomenology presumes that through dialogue and reflection we can understand the meaning or essence of an experience for those experiencing it (Tesch 1990, Creswell 1998, Schram 2003). I also used a narrative orientation in data collection. In semi-structured, open-ended interviews, my co-researchers[3] and I encouraged community organizers, teachers, extension educators, and other practitioners to share their practice stories. This approach presumed that narratives would illuminate tacit knowledge and theories embedded in the practice accounts (Dodge et al.

[3] Two researchers assisted in data collection under my guidance: Jamila Simon conducted one interview and Mike Simsik conducted two interviews. I am grateful for their assistance.

2005). Forester (1999) and others (Hart, Chase) have demonstrated the value of narratives for revealing the complexity of practice; enabling readers to see their own practical situations and possibilities anew; and leading to fresh lines of theoretical inquiry.

I purposefully selected (Patton 1990) individuals identified through peer referrals or national award programs. Their practice shared criteria central to the study's focus: some form of environmental action and some degree of shared decision-making with youth. In addition, I limited selection to professionals working predominantly with youth ages 10-18. Beyond these shared criteria, I sought to include individuals working within diverse contexts that might have implications for their practice (Table 3.2). For some, environmental action was a central focus of their work with youth, while for others it was a small component.

Table 3.2. Work contexts of practitioners interviewed.

Position	Teachers, community organizers, youth development specialists, program directors, extension educators
Programmatic context	Environmental education, science education, youth development, community development
Educational setting	24 non-formal settings, 9 schools
Geographic location	21 urban, 5 rural, 3 suburban, 2 small city, 2 statewide
Geographic region of U.S.	22 Northeast, 5 Southeast, 4 West coast, 2 Midwest

My co-researchers and I interviewed thirty-three professionals (18 female and 15 male; 7 persons of color and 26 white) in 28 different organizations at which point it appeared that saturation in the central concepts of interest had been reached. I interviewed practitioners based in New York State in person and others by telephone. Using a general interview guide with an outline of issues to be explored, I adapted questions in wording and

sequence to specific respondents in the context of the actual interview (Patton 1990). Each interview began with general questions about the individual and her work followed by the detailed telling of a specific success story.

Using narrative was a strategy for ensuring that interviews produced trustworthy practice accounts. Throughout, I posed context-appropriate probes to solicit additional details and encourage the interviewee's reflections on her practice. My own prior experience facilitating a community-based environmental research and action project with youth (see Chapter 5) enabled me to ask suitable follow-up questions that encouraged practitioners to provide more detailed and reflective descriptions of their experiences. The interview concluded with questions designed to gather additional perspectives not yet captured.

Interviews lasted 33-86 minutes with most lasting about an hour. All but one were audio recorded and transcribed by a professional clerical assistant. I reviewed transcripts for accuracy with the original recordings, and the transcribed text became the data used for analysis and interpretation. Reviewing each interview transcript in its entirety, I recorded my impressions of the central themes evident in each. Tensions experienced in shared decision-making were explicitly described by over half the interviewees. Thorough analysis of transcript excerpts relating to this theme and the portions of all 33 practice accounts in which practitioners specifically described their interactions with young people and decision-making processes led to the interpretations presented within.

Uncovering the Invisible Adult Role

Practitioners viewed youth as capable of making valuable contributions and demonstrated a strong commitment to young people's participation. Like many written accounts of young people's environmental action in which emphasis on youths' contributions obscures the roles of adults involved, practitioners interviewed also typically highlighted young people's roles in a project. By probing for more detailed information and specific examples, I began to uncover the essential but frequently invisible practitioner role. Below, I share excerpts from a single interview that illustrate the progression in many practitioners' accounts from relaying youths' contributions to describing their own.

The students of this middle school teacher received a national environmental excellence award for their environmental action project. To provide context, and also to illustrate the frequent invisibility of the practitioner's role, I begin with an excerpt from the project description on the award-presenting agency's web site:

> A project to help preserve the Fender's blue butterfly was developed by 30 sixth-grade students who worked on the project until they completed the eighth grade. …The students first chose local endangered animals for their 3-year project. They then narrowed their focus to the native and endangered Fender's blue butterfly …
>
> The students learned all they could about Fender's blue butterfly from the Internet and local experts. It became clear that the most important factor endangering this butterfly was the loss of its habitat. … After 3 months of research, the students devised a two-part plan for their project. The first part of the plan involved restoring some of the butterfly's lost habitat. They found a park that was being converted into a native prairie by the county public works agency. The students then spent 7 class days harvesting and cleaning native prairie seeds, preparing a plot in the park for seed cultivation, and removing weeds from the plot. After 2 years of labor, the student plot was transformed into a budding example of a [native] prairie.
>
> The second part of the students' plan was to develop a Celebrating Prairie Festival to be held for over 600 elementary school children in the district. … In developing events for the festival, the students composed

> a bilingual play (in English and Spanish) about the life cycle of and threats to Fender's blue butterfly. They also developed different activity stations to encourage hands-on learning among the children …

From the above description, one could conclude that this project was entirely student initiated, organized, and managed.

In the interview excerpt below, however, it is clear through the teacher's frequent use of "we" that this project was a collaborative effort. Still, it remains difficult to discern the specific roles of youth and the practitioner:

> … one of the [student] class leaders was very passionate about helping an endangered animal. Because one of the main tenants … is that the kids choose, and she had a lot of sway and she convinced the class about the Fender's blue butterfly …
>
> We needed to find a way to make an impact. We did some research which was rather chaotic because we don't know where it's going to lead us. We make phone calls, we use the Internet. … But [the students] realized that habitat destruction was a big part of what was going on with the Fender blue. So then we all started sending out feelers to try to find some habitat that we could restore and we came across this county park, just south of town. And had a connection through Public Works and they said it would be great if we could help them restore that prairie and that would be a place that the Fender blue could actually live.
>
> And so then for the next two years we spent a number of days out there just doing prairie restoration under the supervision of our county worker. So by this time we've been out there a while … We're nearing the end of our 7th grade year and I mentioned to them that this was good, a nice hands on component. I suggested that they try and expand the project a little bit and they settled on doing an educational festival about the importance of prairies and specifically about butterflies and so for the next three or four months of school time we developed the festival. And everyone kind of chose an area of interest and … it must have been around 500 kids [that came] to this festival and between that and the prairie restoration the project evolved very nicely.

In the next excerpt, as I encouraged the teacher to reflect on his role, it becomes clear that while this was a student-selected and largely student-directed project, the practitioner played a substantial role guiding youth and influencing project direction as well.

> Interviewer: How would you describe your role as an educator? Take the Fender's blue project for instance. How would you describe your role, if you could choose an analogy or metaphor that might capture or describe the role that you played?
>
> Teacher: Some kind of metaphor for the … structure to hold it together. The kids, once they choose the topic they're off and running and I try to let them do things but I will try and grease the wheels in one direction or another. … The students probably make about half of [the phone calls to local experts during our research]. I do make a lot of those calls just because I get into the topics and I want to be successful. And in the summer I'll be calling around and I'm trying to set up a framework. …
>
> And as I find directions and things invariably my research will end up in a kind of a quiet anonymous donor supporting, and they don't always know what a big role I'm playing in where they're going. They're making decisions but often they're making decisions based on options that I'm the only one presenting because I will do up to half of the research just because I'm having such a good time doing it. So maybe an anonymous donor, cheerleader, certainly guide.

Like this practitioner, many others emphasized the importance of involving youth in decision-making, encouraging youth ownership, and following young people's lead. Yet, all also described guiding youth in the process. Indeed, a few practitioners explicitly stated that it was irresponsible of adults to let youth go it alone. Expressing a sentiment echoed by many, one science teacher said, "I take very seriously the responsibility of turning kids on to something that [might not] come to fruition."

Environmental Action as Youth-adult Partnerships

Stories of youth creating positive environmental change typically highlight the impressive contributions of young people. A more accurate depiction, however, would regard these experiences as youth-adult partnerships in recognition of the important but frequently invisible adult role. Only a few practitioners described it in this way; most downplayed their own roles and emphasized those of youth. It was evident across interviews,

however, that practitioners played essential roles facilitating, mentoring, guiding, coaching, and advising youth. In practitioners' detailed descriptions of youth-adult interactions, I saw strong parallels with literature in the youth development field on youth-adult partnerships. Thus, while I began with a conceptualization of this phenomenon as youth participation in environmental action, I came to believe that youth-adult partnership provides a more apt theoretical construct.

Youth-adult partnerships are not a new phenomenon (e.g., Hanna 1936); however, their contemporary re-emergence has been considered an innovation (Zeldin et al. 2005a) because it starkly contrasts trends in recent decades that have isolated youth from non-familial adults in their communities (Eames-Sheavly 1999, Camino and Zeldin 2002, Zeldin et al. 2005b). While most research on youth-adult partnerships has occurred in community programs, Cervone and Cushman (2002) concluded that the most successful student-teacher relationships in schools also constitute youth-adult partnerships. A youth-adult partnership refers to adults involving youth in responsible, challenging action that meets genuine needs with opportunity for decision making in an activity whose impact extends to others in the community (Camino 2000). At the heart of youth-adult partnerships lies shared decision-making (Camino 2000), which occurs when adults and youth collaborate in decision-making, planning, and implementation of a project (Hart 1997, Driskell 2002). Youth-adult partnerships also involve mutuality in teaching and learning (Camino 2000). These defining characteristics of shared decision-making and mutual learning were strongly evident in practitioners' narratives, as I illustrate next.

Mutual Learning and Shared Decision-making

One science teacher stated, “It wasn’t dictated by me and it wasn’t just created by them either.” Inspirational examples of environmental action were typically the result of collaboration between a practitioner and young people that often also involved other adult community members. Practitioners did not view their role as one of expert, authority, or even primarily as a teacher; rather, most offered analogies of being a facilitator, coach, mentor, or guide. Collaboration involved mutual learning and sharing decision-making power with youth. Many interviewees valued learning from young people, as did this coordinator of youth in an urban agriculture program:

> … to teach you have to be willing to be taught as well. And I think that is one of the most important things I've learned … don't come at it like you're the teacher and they're the student, come at is as you're both, it's reciprocal ... so if I'm teaching someone about how to prepare [food] or [its] nutrition level, they may teach me something about the street, or something that they learned or studied, or something that they're really into.

Other practitioners spoke about youth taking them in directions that they had not previously thought of (e.g., by incorporating the arts into an environmental project) or into unfamiliar subjects (e.g., living roofs, biodiesel fuel). These practitioners enjoyed learning in new areas as they guided youth in exploring questions that they could not answer themselves. Said one middle school teacher, “And it's also very exciting as [an] educator. They'll take me in ways that I'm not necessarily comfortable with or knowledgeable about but we'll learn the road together.”

In addition to valuing mutual learning, most practitioners expressed a strong commitment to sharing decision-making power with youth, as the words of a science teacher and environmental club advisor at a suburban school reflect:

> You allow them to be creative and allow them as students to come up with the ideas of where and what you want to do, where you want to go with your organization and what you want to do. If you direct it, it's not their ideas, they're not empowered, they're just following you. If you give them the power to come up with their ideas then they're more motivated to succeed.

Similarly, the program director of a community organization in an urban neighborhood explained:

> … we really believe in the kids' own capacity to kind of chart their own way and develop their own work and so I really see my role as guiding them to that and getting them to realize that they can do that. So I think our whole curriculum, especially in the summer, is geared towards getting them to realize that they have the power to make change, to do what they want, if there's something about the program that they don't like, they have opportunities to tell us and to make change about that.

In practitioners' narratives, youth were responsible for many decisions, both small and large. The following story of how youth chose the name for a club that monitors water quality illustrates a small, yet important decision for youth ownership of the club. The education specialist at an urban watershed center reflected:

> People now know who we are. We have a catchy name – that helps. The kids came up with that totally on their own. I told them that they had to have a name for their club, this was our first meeting, and I said they got to choose their name and I said we could think about it for a month and then talk about it next month, and one of the kids goes, 'Nope, we're not leaving tonight until we have a name.' And I'm like, 'All right.' And so they started throwing names out and when they came up with the Creek Freaks, we're here at the park run by a board of directors and I thought 'I don't know if the board of directors is going to go for this' but they did and it's wonderful. One of the kids even drew the logo for us.

In several, although not a majority of accounts, youth were responsible for deciding the focus of a project. Below, a program director explains the impetus for students' decision to research and then produce a video presenting their analysis around a proposed housing development in San Francisco:

> Last year the students had a conversation about affordable housing in the United States, and in San Francisco in particular. That conversation was pretty intense because most of them feel that they will not be able to live in San Francisco when they graduate from high school. It's just not feasible for young people, and even some young professionals, to live and work in the City. So they wanted to know why that was and

> what was being done about it. So we took the kids to a planning commission meeting so that they could begin to see the process in which planning happens in the City. And at that there was a presentation from the developers who were trying to get approval for the Rincon Towers. The kids just came back outraged, just furious, because, 'Okay, we need a place to live and they are building multimillion-dollar condos. Whose agenda is this, and isn't it really just obvious that the City doesn't care?' So we called the Planning Department and they sent two of their people over, who explained the process for creating affordable housing, the Rincon Towers project in particular, and showed that a certain percentage of housing had to be affordable housing. So the kids began studying this whole development.

Youth ownership and influence in decision-making was substantial throughout this project, which grew out young people's passion about the issue.

Tensions within Shared Decision-making

Many practitioners described what I refer to as "tensions" within shared decision-making with youth that they often spoke of in terms of "finding the right balance" in various dimensions. I use the term tension to reflect competing forces evident in practitioners' narratives but do not mean to imply that these were negative experiences. Rather, practitioners identified managing these tensions as a primary challenge or essential skill in participatory practice with youth.

Some practitioners described a fundamental tension within encouraging youth freedom while providing adult-directed structure. An extension educator described the result of encouraging youth autonomy with insufficient guidance in an urban forestry program:

> A youth [led] component was part of the process last year, and what we ended up doing was not desirable because it was poorly defined. We should have given a framework in which they make decisions [but] we left it incredibly open. And they came up with rehabbing vacant lots within a timeframe we couldn't do. So we said, 'You're going to work in this vacant lot, and you can come up with whatever designs you want to.' … That's what we should have done to begin with.

Reflecting on the skills required to partner with youth, a science teacher at a suburban middle school emphasized the challenge of creating the “right” degree of structure:

> The main part is having a structure set up where students can be successful and then letting them be successful. So the tricky part is you have to say, ‘Okay, how can I organize this so that students have the best chance of succeeding and then how can I get out of the way?’

Other practitioners described a closely related tension between stepping back to let youth lead and stepping in to keep a project on track. The director of an urban action research project reflected on the difficulty that adults often experience in letting go of control:

> Christine[4] [a college student working with the teens] … was very strong willed and very passionate and compassionate but in a controlling kind of way so it was really difficult for her to step back and let the young people … define how things were going to play out there. She really felt like we had to do [it] this way and that she had to do it or they weren't going to do it. And in my experience there's always this initial period where you step back, where you really feel like everything is going to fall apart and then it doesn't, it surprises you, and she just couldn't take that step.

The coordinator of a youth development program shared her observations working with adult volunteers who advised youth on a statewide conservation council:

> [You] have to feel comfortable in letting the teens take the leadership but also be aware of when things are not happening and that someone's not following through with their responsibility [and encourage them to do so]. … I've seen advisors that probably sit back too much and then those that still are maybe too much in the middle of it all. So there's a fine line there to get yourself situated where you're allowing kids to take as much leadership as they want, encouraging what is needed, yet not making the decisions necessarily for [them].

The need to take a project in directions that met youths’ interests while also fulfilling practitioner’s goals related to the content of a science course or mission of a community organization was another area of tension described by some, such as this science teacher in an urban high school:

---

[4] Pseudonym

> You have to have broad goals that can be met by numerous routes. … The kids are the head of the project [but] I need it to be meaningful in terms of the class and so I am directing it in terms of where it needs to go and they're the ones that are [also generating ideas] … like [there's] also going to be another group out there that will be building bat boxes because that's what [the kids] want to do.

Some practitioners were astutely aware of the power differential between themselves and youth, another dimension of the tension experienced in shared decision-making. As the coordinator of an action research project with youth in urban neighborhoods conveyed:

> … I go back and forth because I think being a partner requires that you articulate your perspectives but there's a huge power dynamic at play, me as a [professional], me as experienced person in this project, me as a 42 year-old, just carries a weight with it that a 12 year-old kid in the neighborhood doesn't have. So how you balance that without being a silent partner, which I think is irresponsible too.
>
> I mean I definitely don't phrase things, or try not to phrase things, as ultimatums or this is the way it should be but as here's my perspective or my opinion or here's some examples of things that were done [elsewhere] so it lays out a range of options. But there are some things that I push like this whole thing about bringing in new people, I think that's important so I'm going to put it out there and they can say that they disagree with me but it gets back to the core principles for the project, so I guess when it's [about] core principles I'm a little more direct. When it's about how do we do it and approach it, I try to lay out options and examples much more, so there's no blanket approach.

Others also described expressing disagreement in an open, transparent way that respected youth autonomy while conveying views based on the practitioner's greater depth of experience. The manager of a rural youth development program explained:

> The other thing that is important is that [youth learn that] it is alright to disagree. And that's really good to be able to articulate that. Or let people know. Because then, for your own self you are feeling respected. But you are tolerating. You are being helpful. You are allowing the whole group to exist. As a group of individuals. Who are together. And, so I demonstrate at times, 'You know it's just my opinion, and I am going to go with the group, but you know what? Mmm, boy! This is a hard one!'

The Autonomy-authority Duality in Shared Decision-making

Evident within practitioners' accounts of shared decision-making with youth was a tension between encouraging youth autonomy while retaining some adult authority. Practitioners experienced various dimensions of this tension, such as "balancing" youth freedom with adult-provided structure, stepping back to let youth lead and stepping in to keep a project on track, integrating youth interests with curriculum or organizational goals, managing power dynamics, and communicating openly and transparently. A useful construct for describing this tension is the concept of a duality (Figure 3.1). Avoiding the oversimplification posed by a dichotomy in which youth autonomy and practitioner authority represent opposite poles, a duality refers to overlapping yet conflicting activities that drive the dynamics of a system (Barab et al. 2003). A duality is a "single conceptual unit that is formed by two inseparable and mutually constitutive elements whose inherent tensions and complementarity give the concept richness and dynamism" (Wenger in Barab et al. 2003: 240). Its usefulness is in its pairing of two seemingly separate elements and recognition of their interdependence and continual, dynamic interplay (Baek and Barab 2005). Another example of a duality is the tension between coherence and diversity within a community.

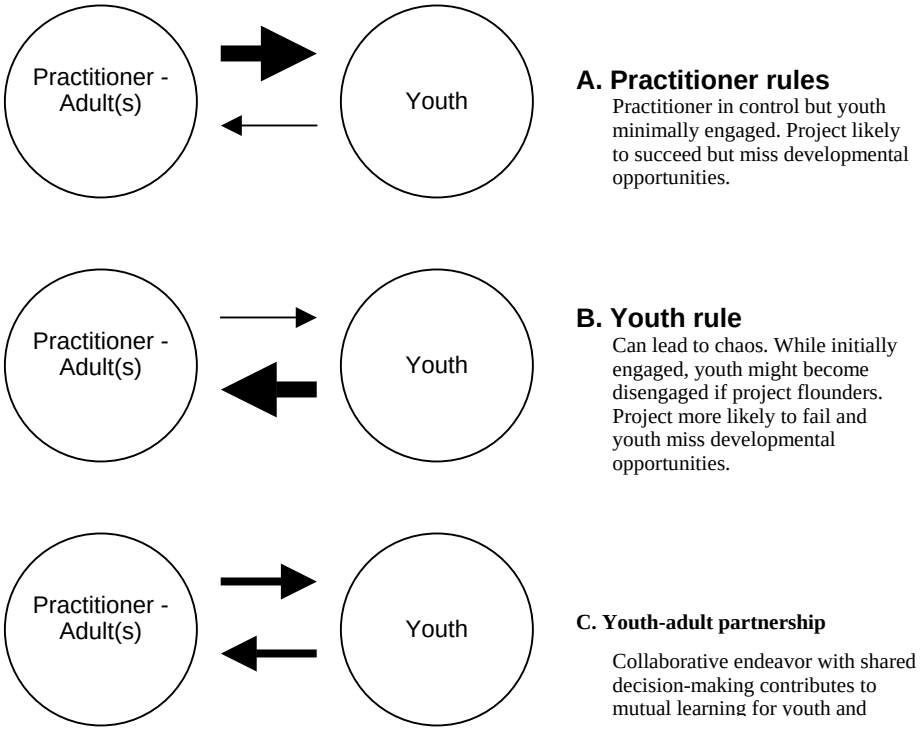

Figure 3.1. A simplified representation of the autonomy-authority duality experienced by practitioners in youth-adult partnerships creating positive environmental change.

The autonomy-authority duality is not unique to youth-adult partnerships involving environmental action. Others have found in non-environmental contexts that adults often require training and reflection to develop the ability of encouraging youth autonomy and voice while concurrently providing instrumental and emotional support (Camino 2000, Zeldin et al. 2005b). In a review of empirical experiences, Camino (2000) observed that one of the most strenuous skills for adults to actualize in youth-adult partnerships was providing legitimate opportunities for youth to take on meaningful roles while also holding them accountable.

The fact that young people are developing in their capabilities magnifies the complexity of the autonomy-authority duality in youth-adult partnerships. Lack of experience and undeveloped cognitive tools limit adolescents' capabilities to initiate and carry out longer-term projects (Larson et al. 2005). In a nascent stage are adolescents' abilities to think abstractly (e.g., to devise a plan including multiple components and actors in a sequence of actions), regulate emotions (e.g., to complete a project despite frustration or boredom), and overcome egocentrism (e.g., to recognize that people experience the world differently) (Larson et al. 2005). Larson and colleagues observed that "when youth hold sole responsibility, their work can stall or become disorganized, which can undermine their motivation and the success of the project" (Larson et al. 2005: 175). This leaves practitioners with a paradox: taking over control diminishes youth autonomy but giving youth too much control can take a project off track. Adolescents are, however, capable of functioning at higher levels of initiative with others' assistance. Thus, a practitioner's handling of the autonomy-authority duality is critical because young people are limited in their capabilities for autonomous action without sufficient structure and support, which in turn can contribute to the development of initiative (Larson et al. 2005) and other capabilities for participation.

Although in the abstract this might appear common sense, in practice well-intentioned adults have sometimes done a disservice to youth by assuming that a youth-adult partnership means adults "getting out of the way" or all partners assuming equal roles (Camino 2000, Camino 2005). Camino (2000) distinguished between equality and equity among youth and adult partners. Adults can disempower youth by offering too much autonomy. For

example, adults perpetuated power imbalances when they encouraged youth to organize and run their own meetings yet overlooked young people's lack of experience in doing so (Camino 2000). Similar to experiences described by a few practitioners in this study, well-intentioned adults can offer too much autonomy to youth without providing sufficient structure and support to help young people be successful. Youth-adult partnerships require that adults find a middle ground between being too directive and too *laissez faire* (Larson et al. 2005). In the context of schools, Kyburz-Graber (Kyburz-Graber 1999) described this middle ground as a "participatory reflective" style of educational practice in which teaching and learning is a transactional, often unpredictable process that involves teachers and students as partners with reflection as a crucial element.

Rich interactions and innovative practices (Barab et al. 2003, Baek and Barab 2005) can occur in the "space between" (Krasny and Tidball In review) the seemingly separate yet interdependent elements of a duality. In practitioners' narratives, what practices were evident as practitioners described their interactions with youth in the "space between"? Next I offer insights into the diverse strategies through which practitioners approached the paradox of the autonomy-authority duality by describing how they provided structure and support as youth took on new responsibilities and challenges.

Approaches to Managing the Autonomy-authority Duality

Every practitioner described creating a structure within which youth directed their own actions. As an extension educator said, "You create the framework and they operate within that framework." Structures varied in design and the decision-making latitude allowed youth both among

practitioners and within different components of a single project or program facilitated by the same practitioner. For example, environmental action projects connected with school science classes often had course and extracurricular club components with different structures. Likewise, some practitioners structured programs to allow individual youth to participate at different levels in nested leadership opportunities as they gained experience.

Some, although not a majority (7 of 33), described operational frameworks that provided a process within which youth wielded substantial influence in deciding a project's topical focus and how to carry it out (Table 3.3). A few practitioners, however, spoke of challenges in letting youth decide the focus of a long-term, collective project that arose from young people's lack of experience or unfamiliarity with the possibilities for action. To address these concerns, practitioners who believed strongly that youth must choose a project's focus often introduced issues to youth for their decision-making consideration through films, guest speakers, field trips, conferences, or community forums. These practitioners played important roles in helping youth consider and assess the feasibility of action possibilities.

Table 3.3. Examples of structures with varying degrees of youth and adult influence in project initiation and management.

Example of structure with youth-initiated and largely youth-managed action
With over 200 students volunteering roughly 3,000 hours annually and an impressive list of accomplishments, Students Against Violating the Earth in Souderton, PA was known for its student-managed environmental education campus that featured a student designed and built environmental demonstration home and sustainable energy classroom. SAVE's advisor attributed much of the group's success to its democratic structure: … but the structure of the SAVE organization is also kind of unique in that I only count as one vote, I've always done that. We have no elected membership, no elected leaders, so anybody at any level can get involved with anything they feel very strongly about. So some students feel very strongly about the recycling program and they then will take charge of that program. To me if you have an elected leadership it seems like everyone just sits back and waits for them to do all of the work. This way if a student's like, 'You know, Mr. Jones we really need to clean up this stream,' and my comment, and I always give them this, 'Okay that's what you want to do, then let's organize something, and we'll put you in charge.' And so a sophomore could be in charge of an entire program or a senior could be in charge of an entire program. The only thing that we have outside just the general membership is what we call leadership council and that is open to any student who wants to come. We meet before school every Friday morning for breakfast and it's the leadership council, whoever shows up that week, who makes decisions for the group. Because our group is quite large … and so I need to depend on a smaller group to discuss issues and we get a lot of requests for volunteer work and for help in different projects and so the leadership council, whoever wants to come to that leadership council in the morning, those are the ones who make the decisions for the group. … at our very last [leadership council meeting] there was a tree planting program looking for volunteers, so we had to decide whether or not we wanted to get involved with that, but at the same time we had our own … community volunteer day at our own building that we're constructing so the leadership council had to make a decision could we do both or should we just focus on one, and that's what they did. Also at that [meeting], the final vote on a community organic and natural food co-op. We had a student who wanted to do that and she put together a program and then she had to present it to the leadership council and they had to make the decision of whether we were going to go ahead with that. So those are the kind of decisions they do. *This structure allowed students to participate as much or as little as they chose. It provided a forum in which students could propose an idea and, if successful in persuading their peers that their idea was worthwhile and feasible, take the lead to make that idea reality. The structure reflected the practitioner's philosophy that youth initiating action is essential for youth empowerment:* Probably most important of all … is when you structure your group, you allow them to be creative and allow them as students to come up with the ideas of where and what you want to do … If you direct it, it's not their ideas, they're not empowered, they're just following you. If you give them the power to come up with their ideas, then they're more motivated to succeed. And I think that's really, really important, so that when you structure an organization you've got to allow it to be student-centered.

Table 3.3. (continued)

Example of adult-directed structure within which youth decision-making occurred
The director of an urban environmental education program that partnered with schools to train students as community organizers around environmental issues described the evolution of the program over its 20-plus year history: At the beginning of the program, we tried to have the [students] be very involved in the decision making, about what projects get done, because that was our whole idea, our whole theory. It didn't work all that well in a lot of places. Some places it did, but a lot of students simply were too young. … What we've found is that, even when we had kids choosing the program, that after 5 or 6 weeks, they would get tired, or get frustrated, or they wouldn't wanna continue. It's a rare kid who's never done social action before who really wants to push it through until the end, to the next year. So we've found that if we can turn kids on, and do good teaching, and we can get kids motivated even if they didn't come into the program at the very beginning with a desire to do it. And we have a track record of doing that. … The way the program functions right now is that we go in with generally an agenda. We have an idea of what we wanna do, based on our knowledge of the city, we definitely talk to the local community board, we talk to local people, we talk to the school, we talk to the teachers … and if the kids have ideas, we certainly try to integrate them if we possibly can, but usually they're inexperienced, they haven't done it before. … So generally we come in and we present the project, and we do the project with them and we try to give them choices within the project, what they do, whether they do fundraising, or they do outreach work … and that they do fairly well in choosing and sticking with it.

While some felt strongly that young people's selection or initiation of a project was critical to its success, many others demonstrated that youth ownership could develop within adult-initiated projects with higher degrees of adult-directed structure (Table 3.3). Many described environmental action where, for various reasons, the practitioner decided the overall focus. Some needed young people's actions to relate to organizational goals or state education standards, while others based decisions on constraints and opportunities in the local environment. Although practitioners decided the general focus, youth exercised some autonomy in decisions of project implementation.

Regardless of how a project began, implementation was a collaborative process influenced by youth and adults to different degrees. In some examples, youth generated ideas and practitioners played a critical role in

securing resources, garnering the school board's support, or connecting with key agencies to bring youths' ideas to fruition. For example, a science teacher reflected:

> So the [students] looked at [native] plants and we have a park right next to the school that was just a park next to the school. And I contacted the Parks director ... and told him about what the kids were interested in, what we'd like to do, and he gave us permission to take a portion of the park and restore it to the native Missouri prairie. So then I had to find the money and that's when I started on my journey of becoming an expert grant writer.

At other times, practitioners guided youth in securing the resources, garnering the school board's support, or connecting with key agencies themselves. For example, a community organizer guided youth in the preparation of a successful grant proposal to fund a tobacco-free fair to educate community members about health, environmental, and social justice issues around tobacco.

> My young people wrote a mini-grant … and they were awarded the mini-grant and it was a joint effort between 4 of my youth to have a tobacco free youth fair … [At first] they were afraid of writing a grant because they were like, 'We're not going to get it, we're not smart enough to write a grant,' and then watching them go through that and actually putting it together and implementing it was an awesome thing to see.

Thus, youth and adults jointly managed projects with varying degrees of shared responsibility. The variation in structure provided by practitioners suggests that no single, best approach exists. Rather, practitioners developed structures tailored to young people's capabilities, the practitioner's own comfort level with sharing control, and other situational forces, such as resources, time constraints, curricula requirements, or cultural norms.

Many practitioners emphasized the importance of engaging youth in actions that made a real difference in their school or community. These

practitioners believed that contributing in real, relevant ways provided youth with opportunities for accomplishment and recognition that enhanced youths' sense of confidence and efficacy. When youth engaged in making real contributions to their community, practitioners observed that they often took on new challenges and responsibility although sometimes not without prodding. In doing so, youth could find themselves in new situations, such as giving a presentation to local business leaders to request donations for a project, with which they had little prior experience. Practitioners helped youth to be successful in meeting challenges by formally training or spontaneously supporting youth. These two strategies were by no means exclusive, and practitioners used diverse specific techniques (Table 3.4).

One approach to supporting youth in action creating positive environmental change was first to train youth and then step back and let youth lead. During a summer program coordinated by a middle school science teacher, students managed a native plant sanctuary, raised butterflies for release into the wild, organized day camps for younger children, and led public tours of the butterfly house to educate community members. The teacher reflected on the role of adults in the program:

> We do a lot of the pre-prep work to get the students ready and then once that's done, basically our job is just to oversee but as distant as we can. The further we can draw ourselves away from the students the more successful we feel they've been. … The kids asking each other questions instead of asking me questions also shows me that it's worked. So it's initial training.

Similarly, practitioners working in community organizations drew on curricula, such as that of The Food Project, and designed training workshops for and with youth around sustainable agriculture, environmental justice, community organizing, media, policy-making, conducting research, and public speaking,

for example. These practitioners also used socially focused curricula designed to raise young people's consciousness around issues such as gender, diversity, and personal identity. While adults held responsibility for overall training, practitioners described asking experienced youth to help design and facilitate workshops, thereby encouraging youth autonomy. Designing training workshops that were interactive and hands-on through use of role-playing, breakout groups, neighborhood tours, field trips, films, and the arts, for example, were important to sustain young people's interest.

Practitioners also helped young people succeed in fulfilling the responsibilities and meeting the challenges concomitant with increased autonomy in environmental action by providing "on-the-job" training. Table 3.4 illustrates diverse techniques through which practitioners supported youth. Managing the chaos, predicting where problems might arise, and anticipating what support youth needed were challenging for some practitioners, such as this middle school teacher:

> The chaos is a lot when we're off [with the project] … Anticipating where they're going to need support, especially in dealing with the public, [is a challenge]. Kids getting on the phone and someone from the university answers and they'll just start talking, they don't introduce themselves, they don't leave phone numbers, they don't give any background at all. They assume the person knows everything. So teaching those skills spontaneously and trying to get better and better at predicting them [is a challenge].

Table 3.4. Examples of strategies used by practitioners to support youth as they encountered challenges associated with increased autonomy in environmental action.

Support provided	**Context**	**Example – excerpt from practitioner interview**
Developing skills and professional conduct	High school students prepared a presentation to request donations from local business leaders to build an environmental sustainable energy classroom in their suburban community.	My role is to make sure that they're prepared. In the case of the presentation the way I would look at it is I make sure that they have everything they need to be successful. So they will put a presentation together and the rule is I always check it before. So I go through and I say, 'Look here are some things,' and they always get mad at me because I'm such a perfectionist. I'm like, 'Look you might want to change this, maybe add this in here, and don't forget to talk about this.' And so I just make sure that when they get up there to present or there's a program that they're running, that I've given them all the tools they need to be successful. And otherwise it's up to them.
Asking guiding questions	"Special needs" high school students decided how to market their produce grown at school garden for sale at farmers market.	… we just went and visited a farmers' market, and I was like, 'Look at how these people advertise their products.' And like, 'What do we have going for us that's really special? Are we certified organic?' And they were like, 'What is that?' I'm like, 'Well, this is certified organic - have you seen any inspectors? Do you think we're certified organic?' And they were like, 'No.' So we came to the conclusion that what's really special about us is that we're student-grown food. And we worked on that concept. We talked about it all the time.
Evaluating collective progress and planning next steps	After school youth development program in which high school students, who were paid staff, guided middle school students in the planning and implementation of youth-led community projects.	I have a staff of high school kids …They have to set up the framework. And so the way this program goes is we have our big youth program every Friday after school … Then on Saturdays, all the staff … come. But it's more of a talking meeting. And their task is we review what happened on Friday. Group dynamics. 'Were we successful? Did your plan work? Did you like the way it was set up? What kind of food do you want next week?' Which takes more time than you'd believe …so there is fun involved in that, but they have to plan out really what [they want to do.]
Reflecting on individual performance	Teens participating in statewide conservation council in which young people researched policy options to address environmental problems and make recommendations to the state legislature.	They do have what's called a self-evaluation process [developed with the teens] that they need to fill out to kind of give them some guidelines of really what's expected to make this work … showing up for meetings, communication, meeting deadlines, that type of thing. … We just are trying to set up a system that's fair. That's what we found over the years that some kids did hardly anything and got the same kind of recognition [as] ones that worked real hard. So we're trying to make them more aware of the overall involvement and how this is rated. We give it a point system and they can see if they met the deadline. We're still actually working on that process. Because we want it to be a self-evaluation, we don't necessarily want the adults honing in on them, we want them to take ownership for their involvement and so it's actually still apiece in the working.
Scaffolding – youth take on manageable chunks, discrete projects	In an urban community development campaign to combat gentrification, youth took on discrete projects, such as educating community members in financial literacy, a precursor to home ownership.	… so we're really taking a much more intergenerational approach and really allowing young people to look at the full campaign and package for themselves a portion of it. So for instance in our anti-displacement work, young people have taken on a portion of that where they are doing housing inspections. They're going and doing roof to cellar inspections in various buildings and developing surveys around how people are living. They're participating and being trained as trainers to do financial literacy, so they're taking manageable chunks of it during semesters, during school semesters or during summers, doing a particular number of hours with pieces that have clear beginnings and clear ends so that's it. Stuff doesn't drag on forever because young people are not here forever. They transition and we can't have all our leadership do that and then have to start from scratch again.

Table 3.4. (continued)

Support provided	Context	Example – excerpt from practitioner interview
Scaffolding - helping students to manage time	High school students initiated individual and collective action projects in their ecology course. In all, a dozen projects were undertaken by youth.	… knowing how to facilitate the breakdown of that time so that it's used well. It's so easy for kids to intend especially for projects that require phone calls and communications and getting the materials and being ready on Tuesday so that on Wednesday you've got done that whole piece and it's almost like life teaches you that. By the time you get to be my age you're probably pretty good at it because you've just sort of muddled your way through and eventually figured out how to triage it so that it works. Kids I think for the most part … there were kids in this class that are better at that than I am, absolutely, but most of the kids are not good at that and so figuring out how to help, how to facilitate that process that says some of this work can happen during a 45 minutes on a given Tuesday afternoon, some of this work can't and how do I identify the pieces? How do I arrange the pieces into some at least estimated sequence of order so that I know what I should be addressing when?
Emotional regulation: Encouraging youth not to give up	Youth interns involved in community development program that provides incentives to local merchants to stock fresh produce and thereby increase access to healthy foods in urban neighborhood. Youth generated ideas for incentives to offer and adult staff secured funding to make it possible.	When we had a problem with our refrigeration units, I remember some of the young people saying, 'Well this is impossible, we're never going to get refrigeration units and we're never going to be able to help that store so what's even the point of trying?' Like we might as well give up the project now, that real fatalist thinking and basically we would just assure them … to have faith in us as coordinators and staff that this is what we do, we work our butts off to try and secure these incentives so you hold tight and work on another part of our project and we're going to get these refrigeration units and so of course a lot of them were skeptical. … We had other youth then that would be supportive and trying to help bring a more positive tone to the group and try and assure the people that were negative that we can do this so when we actually did secure the extra refrigeration units, it was really powerful. I mean the young people that had faith were like, 'Yes we did it! We made it happen!' and the other young people that didn't think that we could, it kind of assured them if you work hard enough or you really try to approach things in a professional manner and you don't give up and you don't lose faith and you just don't get deterred when there's roadblocks, you can make change, and I think that for them to see it is even more powerful than if we just had the refrigeration units.
Managing conflicts	Summer program at suburban middle school in which students volunteer in habitat restoration, butterfly rearing, and community education. Youth returning from prior years served in leadership roles as managers for specific work areas.	… there are the conflicts that occur because the students are not used to it. But that's why I'm here and the other teachers are here because we work through those. … The most common conflict with a [youth as] leader is that the leader either wants to do everything or wants to do nothing. That's the two extremes. There are some leaders that don't want the assistant to help at all because they want to do it right and they want to do it their way. And the other one is the leader that just tells the kids to do things and then puts their feet up and drinks soda. So those are the two biggest extremes. And they're very common. They're not uncommon. So those are the two extremes of managerial positions that we have to work with. And we work through with the students okay, 'As your job as manager, what is your job? Are those people going to be willing to work with you if you're not letting them do anything? Are those people going to really see you as a person they can respect if you don't do anything?' So those are the kind of things we work with. And we do have some very heart to heart talk with kids. Sit down, sometimes there's tears. Never in a negative or pejorative way but in a way to explain to them, you're here as a volunteer, that's the other thing. I have every right to ask a student not to come back the next day. … They're here because they want to be here and they're also guests of the school. So it's very fluid but we've only had to do that maybe two or three times in ten years. But it has to be sometimes where a student cannot work with others. But that's two out of three hundred.

Conclusion

This research contributes to understanding around the experiences of practitioners facilitating youth participation in environmental action. The role of adults has been largely absent in both popular stories of youth creating positive environmental change in their communities and scholarly literature around youth participation. While some examples exist in which youth operate entirely independently, most involve a partnership between youth and adults. Conceptualizing youth participation in environmental action as a partnership among youth and adults recognizes the valuable roles that both play in these endeavors. In this inquiry, practitioners viewed youth as resources capable of making valuable contributions to their communities, but understood their own crucial responsibility to help youth be successful. The director of an urban youth and community development organization with high levels of youth participation throughout its programming explicitly expressed what I found implicitly evident in many practitioners' descriptions of their interactions with youth:

> I think we really undermine young people and their relationship with elders when, one, we don't act like [elders] and, two, we tell young people that they can do it all [themselves] … I think adults need to be comfortable with who they are as elders in the community. I think they need to respect themselves and I think they need to really also be able to work with young people in a way that is respectful to young people and young people need to be okay with that too … it is important for [youth] to be able to be in leadership and to sit with leadership …

I believe that the concept of youth-adult partnership captures this sense of developing youth as leaders capable of participating alongside other leaders in their communities. Practitioners' narratives suggested that partnering with youth involves valuing reciprocal learning and young people's assets and contributions; recognizing one's own assets and responsibilities as an elder; being aware of power imbalances and acting to lessen them; following young

people's lead even sometimes when youth go in a direction counter to one's own preferred route; being transparent in communicating one's own opinions and views; and ultimately being responsible and using wise judgment in exercising one's authority when needed. Passionate, dedicated adults who are intentional in their interactions with youth can build strong youth-adult partnerships that contribute to environmental and community change (see Chapter 2). Adults cannot do it themselves, however; they require support in the form of organizational cultures, norms, policies, and structures (Libby et al. 2005, Zeldin et al. 2005a, Zeldin et al. 2005b). In addition, a single adult need not know how to do it all. Some practitioners interviewed in this inquiry found great value in partnering with other adults whose skill set complemented their own.

Adults interested in increasing youth participation in environmental and other community issues can anticipate that they will experience a tension between encouraging youth autonomy and retaining adult authority. Some practitioners experienced this duality as a challenge, while others viewed the ability to share control as an essential skill for success in participatory practice. Colleagues reviewing earlier versions of this paper identified parallels with their own experiences as parents, consultants, and mentors. I suspect that the autonomy-authority duality is central to the experience of many parents, teachers, and youth workers as well as community educators, natural resource managers, and others who facilitate participatory processes with adult learners, stakeholders, and community members. Although the autonomy-authority duality could be quite ubiquitous, it seems that few of us reflect upon and deliberately manage dimensions like power or communication in our interactions with participants in the intentional way of some practitioners in this

inquiry. I hope that others, as I have, might find inspiration from these practitioners to reflect upon the autonomy-authority duality in their own practice and its implications for partnering with youth to create positive environmental and community change.

CHAPTER 4

ENVIRONMENTAL ACTION AS CONTEXT FOR YOUTH DEVELOPMENT

Introduction

Environmental action is occurring in science classrooms, youth development programs, and community organizations throughout the U.S. Although not common, these experiences provide inspiring examples of adolescents and adults working in partnership (see Chapter 3) to create local environmental change in arenas such as food systems, community gardens, habitat restoration, water quality, air pollution, urban development, and environmental justice (see Chapter 2). Environmental action can be viewed as a form of action research in which social and scientific inquiry serves to inform and evaluate action in an iterative, cyclical process (Hart 1997, Mordock and Krasny 2001, McClaren and Hammond 2005, see Chapter 5). As an educational approach environmental action aims not to modify specific behaviors but to develop young people's understanding, motivation, and skills to act on their values (Jensen and Schnack 1997). In addition to improving natural and built environments, these experiences can also help youth grow as citizens because they involve young people's genuine participation in community issues (Emmons 1997, Hart 1997, Jensen and Schnack 1997, Bishop and Scott 1998, Driskell 2002, McClaren and Hammond 2005, Chawla 2007, see Chapters 2 and 3).

Through phenomenological inquiry exploring the experiences of youth and practitioners creating positive environmental change, I discovered strong parallels with theory and empirical research in the youth development field that led me to understand environmental action as a valuable context for young

people's personal growth. Like myself when I began this inquiry, I imagined that others in the environmental field might benefit from greater familiarity with youth development research. Some environmental educators might intuitively understand and use practices promoting positive youth development but appreciate their explicit articulation in a theoretical framework. Others might improve their practice by applying principles of positive youth development. My intent in the application of understanding from the youth development field is to encourage reflection on environmental education practice and provoke research with a more holistic theoretical lens. Elsewhere I have described ways in which youth contributed to communities through environmental action in the forms of tangible change to the physical environment, community education, social and scientific inquiry, policy analysis and advocacy, and products or services supporting community development (see Chapter 2). Here, I focus on the ways in which youth described growing through these experiences and the practices evident in narratives of the adults guiding them to illustrate how practitioners created positive developmental contexts.

Youth Development Framework

Although much environmental education involves youth, many environmental educators and researchers might be unfamiliar with relevant theory and empirical experience in the youth development field. The specific ages by which people define "youth" varies, but the term generally refers to adolescents, those in the period of life moving from childhood to adulthood (Eccles and Gootman 2002). A paradigm shift in the youth development field has occurred in recent decades from a problem-reduction orientation to a broader framework of positive youth development. Whereas the problem-

reduction approach viewed youth as recipients of services intended to decrease problems like alcohol use, violence, or unintended pregnancy, positive youth development takes an assets-based approach that values young people's strengths and future potential in recognition that "problem-free" does not mean fully prepared for adulthood (MacDonald and Valdivieso 2000, Pittman et al. 2000, Eccles and Gootman 2002). A 2000 report by Public/Private Ventures explained:

> The new orientation is more attuned to the basic needs and stages of a youth's development, rather than on simply "fixing" whatever "problem" may have arisen. It focuses on youth's need for positive, ongoing relationships with both adults and other youth; for active involvement in community life; and for a variety of positive choices in how they spend nonschool time. It aims to build *strengths* as well as reduce *weaknesses* (italics in original) (P/PV 2000: 9).

Concurrent with this paradigm shift has been a movement from a "silo" approach viewing youth development in independent contexts, such as schools or youth programs, to consideration of developmental experiences occurring throughout young people's interactions with family, non-familial adults, and peers in and out of school (Benson and Saito 2000). The "community youth development" movement assumes the involvement of young people in their own development *and* that of the community (Hughes and Curnan 2000).

What does positive youth development look like in terms of outcomes for youth? Lists of assets believed to contribute to a person's well-being (e.g., Search Institute 2005) vary in specific items but show general consistency. I include here assets identified in a review of developmental theory, practical wisdom, and empirical research by the National Research Council and Institute of Medicine's Committee on Community-Level Programs for Youth because it is the most comprehensive review conducted to date. The

Committee organized key assets that promote an individual's well-being in categories of physical, cognitive, psychological, and social development (Table 4.1). It is beneficial to have assets in each of the four categories; however, within each category, one can do quite well with only a subset although having more assets is generally predictive of better well-being than having only a few (Eccles and Gootman, 2002).

Table 4.1. Assets that promote well-being identified by the Committee on Community-Level Programs for Youth (Eccles and Gootman, 2002).

Physical development • Good health habits • Good health risk management skills **Intellectual development** • Knowledge of essential life skills • Knowledge of essential vocational skills • School success • Rational habits of mind – critical thinking and reasoning skills • In-depth knowledge of more than one culture • Good decision-making skills • Knowledge of skills needed to navigate through multiple cultural contexts **Social development** • Connectedness – perceived good relationships and trust with parents, peers, and some other adults • Sense of social place/integration – being connected and valued by larger social networks • Attachment to prosocial/conventional institutions, such as school, church, nonschool youth programs • Ability to navigate in multiple cultural contexts • Commitment to civic engagement	**Psychological and emotional development** • Good mental health including positive self-regard • Good emotional self-regulation skills • Good coping skills • Good conflict resolution skills • Mastery motivation and positive achievement motivation • Confidence in one's personal efficacy • "Planfulness" – planning for the future and future life events • Sense of personal autonomy/responsibility for self • Optimism coupled with realism • Coherent and positive personal and social identity • Prosocial and culturally sensitive values • Spirituality or a sense of a "larger" purpose in life • Strong moral character • A commitment to good use of time

What does positive youth development look like in terms of the contexts in which it occurs? The Committee also identified eight features of settings that contribute to the development of these assets: physical and psychological safety, appropriate structure, supportive relationships, opportunities to belong, positive social norms, support for efficacy and mattering, opportunities for skill building, and integration of family, school, and community efforts (Table 4.7). Research conducted since the Committee's review suggests that "support for identity formation" deserves inclusion as a characteristic in its own right rather than subsumed under another feature (Table 4.7). The Youth Leadership for Development Initiative (YLDI) concluded that identity development, "a key developmental task of adolescence, where youth seek to develop an autonomous and yet socially integrated and connected sense of self," has an important place in the standard practice of any organization that touches youth's lives (Lewis-Charp et al. 2003 p. ES-5).

These features, which often work together synergistically with boundaries blurred, describe characteristics of the adolescents' *interaction* with the setting; the processes of interaction are critical to development (Eccles and Gootman 2002). I suggest viewing these features as closely connected to principles of practice because practitioners create many dimensions of settings within which young people's experiences take place. While practitioners do not have influence over all aspects of a setting, they are "gatekeepers … between environmental contexts, desired adolescent outcomes, and developmental processes" (Camino 2005 p. 76). Thus, one might think of the features of positive developmental settings as principles for practice realized through diverse techniques adapted to practitioners' styles and young people's capabilities, while recognizing that institutional,

community, and other forces influence a practitioner's ability to create these features in specific settings.

Youth development researchers increasingly attend to the many, varied contexts in which youth spend their non-school hours. Organized activities, including extra-curricular, after-school, and community programs, can be important contexts that help youth build competencies and successfully negotiate the salient developmental tasks of adolescence. Participation in organized activities has been associated with academic success, mental health, positive social relationships and behaviors, identity development, increased initiative, and civic engagement (Eccles and Gootman 2002, Hirsch 2005, Mahoney et al. 2005). Different organized activities offer distinct patterns of learning experiences (Hansen et al. 2003).

Dworkin (2003) documented developmental processes described by high school students participating in various organized activities. These processes related to identity work, initiative, emotional self-regulation, peer relationships, teamwork and social skills, and adult networks and social capital. For example, youth developed peer relationships by interacting with peers who would normally be outside their existing network, experiencing increased empathy and understanding of others, and experiencing loyalty to peers in their activity (Dworkin et al. 2003). Larson and colleagues (2005) described the development of young people's initiative by overcoming instrumental (e.g., mobilizing one's time and effort) and interpersonal (e.g., coordinating one's work with peers) challenges in the planning and implementation of an agricultural day camp for younger children. They concluded that "challenges appeared to provide the germination for developmental change" (Larson et al. 2005 p. 171). Little research has yet

explored how developmental outcomes differ across extra-curricular and community-based activities (Hansen et al. 2003), nor the specific processes that contribute to young people's growth in these experiences (Dworkin et al. 2003).

In this study, I explored the experiences of youth and practitioners partnering in environmental action taking place through schools and community organizations. Typically, teachers who incorporated environmental action in a school class also facilitated corresponding after-school club or summer programs, and even solely class projects often involved substantial out-of-class time with students volunteering to participate in evening and weekend activities (Schusler, unpublished data). Thus, one could comfortably consider most of these experiences as organized youth activities.

Studies of environmental action programs have focused predominantly on environmental learning outcomes for youth but some also have documented broader developmental outcomes. For example, participating in environmental inquiry and action in their community through classroom instruction enhanced Hawaiian students' critical thinking skills, citizenship competence, reading, writing, and oral communication skills, familiarity with technology, and self-confidence (Volk and Cheak 2003). Evaluation of the national environmental action program Earth Force documented that participants learned to collaborate, conduct research, and express their views and developed increased confidence, efficacy, and understanding of diverse viewpoints (Melchior and Bailis 2004). Participation in environmental action influences some learners more positively than others (Schusler and Krasny 2007). As in research on organized youth activities more generally, little attention has been given to the processes that support or impede young

people's growth through these experiences. This inquiry provides some exploratory insights into such processes.

Methodology

I chose a phenomenological approach because my interest was in understanding the experience of environmental action from the perspectives of participating youth and the practitioners facilitating it. Phenomenology presumes that through dialogue and reflection we can understand the meaning or essence of an experience for those experiencing it (Tesch 1990, Creswell 1998, Schram 2003). Data collection involved interviews with youth (in groups) and practitioners, including teachers, extension educators, youth development specialists, community organizers, and program directors.

Group interviews with youth

I deemed group interviews (Patton 1990) a suitable method for encouraging youth to share in their own words their constructions of their environmental action experiences. I chose group over one-on-one interviews because I believed that youth, who were already familiar with one another, would feel more comfortable in the group environment and that unique insights might arise from the synergy of group discussion. I recognized, however, that interviewing a group of youth would limit the depth of understanding that I would gain about any given individual's experience.

A co-researcher (J. Simon) and I conducted ten group interviews that included a total of 46 young people (Table 4.2) participating in environmental action through nine schools or community organizations in New York State (Table 4.3), which I refer to as "programs" for ease of reference. Programs

involved environmental action and some degree of shared decision-making with youth toward varied, multi-fold goals (see Chapter 2). I identified eight programs through peer referral and one program by its receipt of a national environmental excellence award. I conducted interviews with eight groups of youth in seven programs and a co-researcher (J. Simon) conducted interviews with two groups of youth in two programs. Each group consisted of three to seven youth selected by the teacher or program leader. The young people interviewed were often those most actively engaged with the program or project; thus, the data do not reflect the full diversity of experiences among participating youth.

Table 4.2. Demographics of youth interviewed.

Gender	23 girls and 23 boys
Age	9 to 18 years
Race/ethnicity	4 Asian, 9 African-American, 11 Latino, 22 white
Location	5 suburban, 8 rural, 10 small city, 23 urban (large city)
Educational setting	21 formal and 25 non-formal

While each group interview varied depending on the flow of conversation and participants' time constraints, the interaction generally followed a similar format using a semi-structured, open-ended interview guide (Appendix B). The interviewer inquired about how each young person became involved in the environmental action project or program, likes and dislikes about the project or program, youths' activities and roles, interactions with adults, descriptions of their overall experience, and ways in which youth learned or otherwise benefited through the experience. Like a talking stick in Native American cultures, youth often passed the recording device from one to another as they spoke. At other times, youth spoke out of order, jumping in and building on prior comments as they saw fit. The interviewer asked for

Table 4.3. Characteristics of contexts in which youth interviewed participated in environmental action (46 youth, 9 programs).

Site	# Youth	Educational setting	Location	Focus of action	Program description[1]
A	7	Non-formal	Urban	Community gardening	Community-based youth development program in which participants maintained a community garden plot and contributed data to a citizen science program on urban weed management.
B	3	Non-formal	Urban	Food systems	Community development program in which youth employed as interns participated in agricultural learning and leadership training, growing food for the community, managing a neighborhood farmers' market, and educating residents about healthy food.
C	3	Non-formal	Urban	Food systems	Community development program in which youth employed during the growing season built, planted, maintained, and harvested gardens and marketed and sold their produce. Youth were also involved in business planning and community outreach.
D	4	Non-formal	Urban	Community gardening, open space preservation	Community-based youth development program in which youth participated in developing fitness and nutrition related programming. After conducting a neighborhood survey that documented lack of availability of fresh fruits and vegetables, youth employed by the program reclaimed an abandoned, city-owned lot, where they developed a vegetable garden in which they grew and donated produce for a community kitchen.
E	3	Non-formal	Rural	Community beautification, community building	Community-based youth development program in which high school students employed through the program guided middle school students in organizing community events and service projects.
F	5	Non-formal	Rural	Green building, media	Community-based youth development program in which middle school students produced a “Green Homes” documentary featuring local residents.
G	5	Formal	Suburban	Habitat restoration, wildlife conservation	Middle school science class in which students conducted scientific inquiry in conjunction with action to restore a local, globally rare ecosystem. After-school and summer program in which students managed a butterfly house (where butterflies were reared for introduction to the wild), gardens for native plant propagation, and public outreach programs, including tours and day camps for younger children.
H	10[2]	Formal	Small city	Multiple	High school ecology class in which students conducted individual and collective action projects in conjunction with their course work. Among many projects undertaken were advocating for the school district to install a solar electric system; designing and building a raised garden bed at a home for adults with disabilities; assessing the quality of woods adjacent to the school for wildlife habitat; and developing and teaching a sustainability curriculum to elementary school students.
I	6	Formal	Urban	Roof garden, green roofs, sustainability	High school science class and after school club that designed and built a wheelchair accessible roof garden. At the time of this study, students were engaged in re-design of the space and scientific experiments around the effectiveness of green roof modules with varying design parameters (e.g., plant types, soil medium and depths) for controlling the building’s temperature and reducing its stormwater runoff.

[1] Based on program materials and interviews with teacher or program leader(s).

[2] Two groups of 5 youth each were interviewed at this site.

additional input from less vocal participants to encourage participation of all youth. Interviews ranged in duration from 18 to 65 minutes, with most lasting around a half hour. They were digitally recorded (with the exception of one where detailed notes were taken) and transcribed verbatim.

I analyzed youth interview data across programs. I coarsely coded transcripts by general themes using HyperResearch software to aid in data management. A finer, thorough review of data within each of these general themes (e.g., how youth learned) led to the specific interpretations presented below (e.g., by doing, from adults, by problem-solving, by working with others). I conducted the initial analysis in June 2006 and repeated it in October 2006 in search of evidence that might refute initial interpretations. This led to minor revisions to incorporate additional insights.

Practitioner interviews

In semi-structured, open-ended interviews, my co-researchers[5] and I encouraged community organizers, teachers, extension educators, and other practitioners to share accounts of their practice. I purposefully selected (Patton 1990) individuals identified through peer referrals or national award programs whose practice shared criteria central to the study's focus: some form of environmental action and some degree of shared decision-making with youth. In addition, I limited selection to professionals working predominantly with youth ages 10-18. Beyond these shared criteria, I sought to include individuals working within diverse contexts that might have implications for their practice

[5] Two researchers assisted in data collection under my guidance: Jamila Simon conducted one interview and Mike Simsik conducted two interviews. I am grateful for their assistance.

(Table 4.4). For some, environmental action was a central focus of their work with youth, while for others it was a small component.

Table 4.4. Work contexts of practitioners interviewed.

Position	Teachers, community organizers, youth development specialists, program directors, extension educators
Programmatic context	Environmental education, science education, youth development, community development
Educational setting	24 non-formal settings, 9 schools
Geographic location	21 urban, 5 rural, 3 suburban, 2 small city, 2 statewide
Geographic region of U.S.	22 Northeast, 5 Southeast, 4 West coast, 2 Midwest

My co-researchers and I interviewed thirty-three professionals (18 female and 15 male; 7 persons of color and 26 white) in 28 different organizations. I interviewed practitioners based in New York State in person and others by telephone. Using a general interview guide with an outline of issues to be explored, I adapted questions in wording and sequence to specific respondents in the context of the actual interview (Patton 1990). Each interview began with general questions about the individual and her work followed by the detailed telling of a specific success story.

Using narrative was a strategy for ensuring that interviews produced trustworthy practice accounts. Throughout, I posed context-appropriate probes to solicit additional details and encourage the interviewee's reflections on her practice. My own prior experience facilitating a community-based environmental research and action project with youth (see Chapter 5) enabled me to ask suitable follow-up questions that encouraged practitioners to provide more detailed and reflective descriptions of their experiences. The interview concluded with questions designed to gather additional perspectives not yet captured.

Interviews lasted 33-86 minutes with most lasting about an hour. All but one were audio recorded and transcribed by a professional clerical assistant. I reviewed transcripts for accuracy with the original recordings, and the transcribed text became the data used for analysis and interpretation. Reviewing each interview transcript in its entirety, I recorded my impressions of the central themes evident in each. Some themes were evident across interviews and others emphasized in a subset (5-10 interviews). I first developed practice themes from the empirical data and then discovered that they overlapped substantially with characteristics identified in other research on practices and settings that promote positive youth development (McLaughlin et al. 1994, Halpern et al. 2000, Eccles and Gootman 2002, Lewis-Charp et al. 2003, Hirsch 2005). Thus, while in this paper I present theory followed by practice, my analysis occurred in reverse.

Young People's Perspectives on their Environmental Action Experiences

How was a positive youth development framework evident in experiences of environmental action described by youth and practitioners? I begin by sharing young people's perspectives on their environmental action experiences before turning to practitioners' accounts. I organize my interpretations from the youth data using the developmental assets framework (Table 4.5) (Eccles and Gootman 2002). I then compare the themes that emerged from practitioners' narratives with features of positive developmental settings (Table 4.7) (Eccles and Gootman 2002, Lewis-Charp et al. 2003). Striking parallels with a positive youth development framework exist in the data from both perspectives.

With the exception of environmental action projects that occurred as part of a science class with participation required, young people said that they became involved through one or more of the following avenues: encouraged to do so by a parent, sibling, or friend; had an interest in the specific topic, such as gardening or video; attracted by another activity at the organization, such as karate or tutoring, and later joined the program of focus; or knew and liked the program leader. Youth in one school-based program valued the service credits that they received for volunteering. Urban youth employed by community organizations identified getting paid for their work as an important factor enabling their participation. Thus, youth typically chose to participate in a particular project or program, although often for reasons other than a specific interest in the environment or community action.

Environmental educators and researchers focus predominantly on outcomes related to the environment, including learners' environmental sensitivity, knowledge, behaviors, and action skills. Approaching this inquiry *without* this pre-determined focus, I discovered that youth more often valued other aspects of their experiences, such as learning patience, responsibility, and teamwork (Table 4.5). Young people spoke about learning in cognitive and affective dimensions that I categorized within the four domains of developmental assets (Eccles and Gootman 2002). In all programs, youth described learning that contributes to intellectual, psychological and emotional, and social development. Youth participating in programs focused on community food systems, nutrition, and health in urban neighborhoods with prevalent drug use and violence also valued learning related to physical development (Table 4.5).

Table 4.5. Learning reported by young people categorized as assets that contribute to physical, intellectual, psychological and emotional, and social development based on Eccles and Gootman (2002).

Developmental Assets	Educational Setting								
	Non-formal, urban				Non-formal, rural		Formal		
	A	B	C	D	E	F	G	H	I
Physical development									
Good health habits (e.g., nutrition, fitness)		X	X	X					
Good health risk management skills (e.g., protecting self "from the wrong")			X	X					
Intellectual development									
Content knowledge: energy efficiency, plant science, earth science, butterfly metamorphosis, sustainability, etc.	X	X	X	X		X	X	X	X
Job preparation, value of hard work	X	X		X	X	X	X		
Knowledge of essential vocational skills: video production, art skills, conducting scientific experiments, teaching, public speaking, interviewing, persuading others		X	X	X		X	X	X	X
Psychological and emotional development									
Good mental health including positive self-regard (e.g., self-confidence, open-mindedness)			X	X					
Good emotional self-regulation skills (e.g., patience, persistence, paying attention)	X	X	X		X	X		X	
Good coping skills (e.g., adaptability)					X			X	
Mastery motivation and positive achievement motivation (e.g, initiative, intrinsic reward)				X				X	X
Confidence in one's personal efficacy (e.g., how to enact change)		X	X		X			X	X
"Planfulness" (e.g., vision, thinking ahead)		X						X	X
Sense of personal autonomy and responsibility	X	X					X		
Optimism coupled with realism		X							
A commitment to good use of time (e.g., balancing work load)								X	
Social development									
Connectedness – perceived good relationships (e.g., teamwork)			X		X	X		X	
Ability to navigate in multiple cultural contexts (e.g., when to "talk street and talk correctly")				X					

The full range of developmental outcomes perceived by youth is likely underreported. My focus on learning limited responses in that youth might have valued but not mentioned other aspects of youth development, such as forming trusting relationships with peers and adults, because they did not consider it something they had learned. On the other hand, because this research did not include the perspectives of youth who were only marginally involved, or had perhaps left a program, it should not be assumed that the experience contributed to the development of assets for all participants. Nonetheless, young people's reports of developing assets that promote well-being through participation in environmental action are consistent with a growing body of evidence from non-environmental contexts that youth civic engagement contributes to positive developmental outcomes (Camino and Zeldin 2002, Balsano 2005).

Young people's descriptions of their activities in a specific action project (e.g., what they did, who they worked with, problems they encountered, surprises along the way) suggested that they developed assets identified in Table 4.5 through experience (often novel experiences), from adult guidance, by overcoming problems, and by working collectively. Excerpts in Table 4.6 from young people's conversations illustrate these developmental processes.

Table 4.6. Developmental processes evident in youths' descriptions of their environmental action experiences.

Developmental processes	**Illustration (focus group excerpt)**
The enthusiastic exchange of two urban youth participating in sustainable agriculture illustrates the impact of ***new experiences*** and the powerful influence of an adult leader***.***	Luis: Daniel, he works here. He like changed my whole lifestyle. I used to be so like not open-minded, for lack of a better word — Robert: Can I add one more thing? Daniel taught me how to survive in — Luis: — the wild? Robert: Yeah, on your own. It was crazy we went camping and — Luis: Like Daniel changed my religious beliefs — Robert: And he taught us how to like drop a bomb [go to the bathroom] in the forest — [much laughter] — and enjoy it!
An ecology student's reflection on the difficulty of getting underway with a group project demonstrates how ***adult guidance*** was a motivating force.	One of the things I've learned the best is just like it's really easy to talk and to plan and to have all these great ideas, but actually getting started, getting started is the hardest thing. Like at first all four of us were like running our wheels backwards and we were getting nowhere. And then [our teacher] finally was like, "Okay, meeting, we're going to have yummy food, we're going to sit down and we're actually going to get you guys juiced and energized about wanting to do this." And once you do get started you do have, I don't know, your thrill takes on … like a whole new level.
Youth described ***encountering and overcoming problems*** that ranged from addressing lead contamination in soil to managing younger children in an environmental day camp. In the production of a video documentary about green building, middle school students told how they dealt with unexpected technical problems.	Lucy: Yes, we faced so many problems. Well I don't want to say a lot, but when we got to Sally Smith's house, like it was just the first day and like one of the cameras like was dead so we had to like run extension cords from her, like she has like [these batteries for her solar electric system], and we had to run extension cords all the way from there … Brian: … the camera was low on battery and we had to use the solar power to generate the electricity it needed. John: But we said that this [video] tape is made out of solar, the tape is being made using solar power. I thought that was kind of cool actually. Brian: Well that was one of the problems we encountered. John: Not really because it worked. Lucy: Even though it was cool, it's still a very problem, because like we all kind of panicked, like everyone's like, "Ahhh, what are we going to do?"
Problems in communication, coordination, and conflict management arose in ***working with others*** on a collective project. A group described the challenges and benefits of working together to design and teach a sustainability curriculum to children at an elementary school in their district.	Susan: The group experience has been the hardest part for me because we like suck in communicating. Christie: Yeah, we were figuring out how to get to the school like 10 minutes before we had to be there. Susan: So it's been a really good learning experience for me in that, one really I'd say good thing about having this be a class project with my peers, is that if I'm doing something on my own, I'm just doing it on my own. And here I learned that to make a big change, or any change, you really have to work with others and working with others is so much more like unexpected surprises. Tory: But at the same time I don't think it's a project that one person could have pulled off. Like each of us is responsible for one lesson plan except Susan did two. And I think everybody brings something different. That sounds really corny but everybody has their own like way of getting to the kids and that's really good because, like every lesson it seems like a different group of kids like respond to a different way of communicating and we all have different things. I think in some ways the group thing has worked really well. Susan: Oh yeah. I agree. It's just been also the hardest part for me too.

Some young people found their experiences participating in environmental action to be challenging (intellectually, emotionally, and/or physically) and at times utterly frustrating. Youth described challenges, such as working through school bureaucracy, working with people with differing priorities, garnering other people's support for a project, learning to communicate with one another, scheduling, juggling work loads, identifying a research question, designing and conducting scientific experiments, planning into the future, and doing physically demanding work. They expressed frustration at the time required to accomplish a task, such as organizing a meeting or editing a video, as well as frustration deciding on direction for their project.

> It was challenging at times. One time we had to cut down like these overgrown limbs from a tree. Like it's hard sometimes, physically hard.
>
> Well I would say it's also challenging … because we always have to think ahead, you always have to look at the big picture.
>
> It can get hard to keep your confidence up when it seems like things aren't going anywhere.

These young people resoundingly reported that the challenges and frustration were well worth it in the end.

> For me, I guess it started off kind of frustrating because the [project] constantly needs attention in order to keep it up to date. But it just felt good knowing we were making a positive impact. It was well worth the frustration.

These dimensions are predictably absent from media coverage or award narratives of youth environmental action projects, but often are missing also from scholarly accounts. Yet, persisting in and overcoming these challenges appeared to be an important dimension of the experience contributing to young people's development (Larson et al. 2005).

Practitioners' Accounts: Interwoven Practices Promoting Positive Youth Development

Interviews with the practitioners facilitating the programs in which these youth participated and with many others guiding youth in environmental action through schools and community organizations across the U.S. further enhance understanding of environmental action as a developmental context. Evident in practitioners' accounts were several themes consistent with positive youth development practices (Table 4.7). Typically, a practitioner emphasized two or three themes and others were evident to a lesser degree. Individual practitioners stressed some themes more strongly than others. For example, strongly evident within the story of a community organizer in an inner-city neighborhood were strategies for building respectful, trusting relationships with youth and creating a physically and psychologically safe space. A suburban science teacher, on the other hand, emphasized the value of connecting students with community members and developing skills that students don't typically acquire in school by challenging them with responsibilities in real work that made a difference to their community. A central theme across interviews not included in Table 4.7 because it was a criterion for inclusion in the study is shared decision-making, a defining characteristic of youth-adult partnerships creating positive environmental change (see Chapter 3). Below I illustrate that practitioners' accounts interwove multiple practices promoting positive youth development.

Table 4.7. Comparison of themes emerging from practitioners' accounts of partnering with youth in environmental action with existing understanding of positive developmental settings.

Emerging Practice Themes and Related Strategies in this Inquiry	**Features of Positive Developmental Settings** (Eccles and Gootman 2002)
Creating safe spaces Physical safety; calming environment of green space; inclusive, respectful environments in which youth can take risks and express themselves.	*Physical and psychological safety* Safe and health-promoting facilities; practices that increase safe peer group interaction and decrease unsafe or confrontational peer interactions.
Providing structure Process framework for youth decision-making; guiding youth in decision-making by helping youth consider options, assess feasibility, etc.; setting overall goals within which youth decide routes to achieve them (see Table 4.9).	*Appropriate structure* Limit setting; clear and consistent rules and expectations; firm-enough control; continuity and predictability; clear boundaries; and age-appropriate monitoring.
Building respectful, trusting relationships Focusing on youth first, then project activities; sensitivity to what youth are going through in other parts of their lives; mentoring; open communication; keeping confidences; honesty, transparency, authenticity; team building activities; hanging out, recreating, sharing meals, having fun together.	*Supportive relationships* Warmth; closeness; connectedness; good communication; caring; support; guidance; secure attachment; and responsiveness.
Bridging differences and creating opportunities for all learners to contribute Involving diverse youth and community members (e.g, academic "cream of the crop" and trade school students; people of diverse age, race, ability or socio-economic status) who would not otherwise interact; matching youths' interests and talents with specific project tasks; encouraging youth to "play their strengths."	*Opportunities to belong* Opportunities for meaningful inclusion, regardless of one's gender, ethnicity, sexual orientation, or disabilities; social inclusion, social engagement, and integration; opportunities for sociocultural identity formation; and support for cultural and bicultural competence.
Setting clear, rigorous expectations Clarity about youth and adult roles; clear behavioral expectations; demanding quality and professionalism in products of young people's work; physically rigorous activity; working in adverse conditions; individual learning plans; written self-evaluation process; de-briefing sessions with verbal reflection on individual and group performance.	*Positive social norms* Rules of behavior; expectations; injunctions; ways of doing things; values and morals; and obligations for service.

Table 4.7. (continued)

Emerging Practice Themes and Related Strategies in this Inquiry	**Features of Positive Developmental Settings** (Eccles and Gootman 2002)
Providing opportunities for meaningful contribution Shared decision-making (see Chapter 3); encouraging youth ownership; making a real difference in communities; valuing youth as experts; recognizing accomplishments; providing nested leadership opportunities.	*Support for efficacy and mattering* Youth-based; empowerment practices that support autonomy; making a real difference in one's community; and being taken seriously. Practice that includes enabling, responsibility granting, and meaningful challenge. Practices that focus on improvement rather than on relative current performance levels.
Supporting youth as they encounter new challenges Responsibility granting; encouragement in rising to new challenges; formal and informal training; guiding questions; scaffolding; emotional regulation; conflict management (see Table 4.10).	*Opportunities for skill building* Opportunities to learn physical, intellectual, psychological, emotional, and social skills; exposure to intentional learning experiences; opportunities to learn cultural literacies, media literacy, communication skills, and good habits of mind; preparation for adult employment; and opportunities to develop social and cultural capital.
Connecting youth with their community Service learning; drawing on local experts; garnering community support; participation in public forums; media outreach; engaging community through the arts; intergenerational programming.	*Integration of family, school, and community efforts* Concordance; coordination; and synergy among family, school, and community.
Expanding horizons through novel experiences Exposing youth to new experiences and ways of thinking about the world and their relationship to it through field trips, conferences, films, workshops (e.g., identity, diversity, social movements); encouraging reflection through dialogue, journaling, etc.	*Support for Identity Formation* (Lewis-Charp et al. 2003) Hands-on immersion and exposure to history; popular youth culture as a medium for political analysis, expression, and identity; mentoring by community adults; celebration of culture and identity through art, dance, spirituality; workshops on issues of power and oppression; support groups; direct community engagement.

To demonstrate how practitioners' accounts interwove multiple practices promoting positive youth development, I share excerpts in which the coordinator of youth in an urban sustainable agriculture program tells the story of a typical summer. I chose this particular one from many that I could have

included simply because it conveys well several themes within relatively concise excerpts. We immediately see an emphasis on building respectful, trusting relationships through a technique called “check-in,” which encourages open communication.

> So they come Monday through Thursday, they work 30-35 hours a week, depending on how much the City can give us to fund the employment aspect. And the day basically starts out with an informal kind of check-in question where everyone participates in some sort of question that will provoke thought and help us learn about each others' opinions and beliefs. We call it "check-in." An example of a question would be, "Did you see what [hip-hop artist] Kanye West said on national television last night? He made comments about racism and how that's connected to the George Bush administration. What do you feel about that? What is your opinion about that? And would you have done the same thing?" Or we'll ask really personal questions sometimes like, "Name the happiest moment of your life, or name one of the saddest moments of your life." So it really just breaks down those walls and helps up be more human with each other and understand each other instead of having so much behind the surface that we don't know about each other. Our goal with that check-in is to really break down those walls and be more personal with each other and be a team. So those are just some basic examples. They sometimes can be really deep and sometimes really easy. And sometimes we assign the kids to bring a question. So they tend to like the easy ones. You can always tell when the youth is doing them and when the staff is doing them because the staff will come at them with the real deep ones, because we will want to hear all this, and they'll come out with like a yes or no and we're like "aw man." So the check-ins are always fun. I do them with everything I do …

In addition to relationship-building, the “check-in” also relates to creating a psychologically safe space and bridging differences by encouraging a respectful, inclusive environment where youth can express their own experiences, feelings, and views while learning about and appreciating those of other youth and adults. This practitioner continues to describe other relationship and team building strategies, as well as how adult staff intersperse the rigorous, physically demanding agricultural work with discussions, films, and other “stimulating-the-mind” activities that encourage youth to expand their horizons.

> … and then after check-in we move into an activity or a game that can be similar. It will be a teamwork-building thing or an ice breaker so we get to know each other. We use the Food Project curriculum from Boston a lot and they have a lot of games and stuff like that. And they have a very extensive curriculum based on food security and food system development and food education. So then we get into the games and activities and then we usually come out and we work in the garden for a couple of hours and that can be anything from moving mulch, digging up new garden beds, planting, weeding, going and buying some perennials, there's always something to do, clean up the park that's nearby here in our neighborhood, go to the school garden that's a couple blocks away and help with their garden. We try to plan ahead but it doesn't always work that way because there's just so much to do and sometimes the days can be very chaotic with whatever comes about. And so we try to get a good three hours in the garden doing physical labor, plus in the hot sun it doesn't always work that well. We don't want to be out in the hot sun all day really working physically hard, so we try to break it up with indoor stimulating-the-mind type stuff and then the physical labor as well. We try to balance that. So it's a good balance of activities, ice breakers, personal discussions, and moments of education where they're watching a film or something like that and then the physical labor aspect.

As the summer story continues, we see how adult staff encourage youth to take greater responsibility in leadership roles, as well as the specific technique of “straight talk,” a tool for encouraging youth and adults to reflect on how well they are meeting expectations in their individual and team performance. In addition, we learn about other techniques for expanding horizons, such as a field trip, which connects youth to the broader community by both drawing on the resources of and contributing to the operations of an organic farm.

> We personally as a staff try to tap into the individuals in the group and see their roles and see their strengths and their abilities and then if we see a strong leader who's a hard worker physically then we ask sometimes if that person can supervise a certain group of people. Or if we see someone who has good facilitation skills then we try to work with that person in facilitating an activity that we're going to do. Then we try to figure out a balanced way of saying like these people are the leaders, these youth are leaders and you have the opportunity to become a leader, it's based on your performance. And so we have reflection times where we reflect on each other's work and it's called Straight Talk. So the reflection times are really good for all of us, staff and the youth staff, to talk about our plusses and minuses and how we perform and how we work.

> That's usually what the summer consists of for a good two months at least. And a lot happens. We go on a lot of field trips to the farmers markets and stuff on the weekends sometimes. We go to an organic farm nearby so they get to learn and see how an organic farm operates. And we do sweat equity type work there where we work for them and weed for like a couple hours and the youth really love that. That's some sarcasm. They like learning about the farm and seeing the animals and visiting and then after that we're like "okay we've got to weed," and they're like "man why do we have to weed?" They weeded carrots this year and I mean it's just always, there's always room for learning and teenagers like we're weeding carrots and half of them are like joking around and the other half are really taking it seriously and so then you really find out who the leaders are because they're like "come on you guys we need to get this done" and they're like "no, no." I mean it's always interesting when we go to the farm. There's always some sort of disciplinary action that has to take place. There's always some kid who just wants to cause a ruckus.

The description of the farm visit reminds us that this is not easy work; practitioners sometimes face disciplinary and other challenges. As the story concludes, this practitioner emphasizes again the value of the relationships formed during the summer program.

> The summer is just the core time in the program and it's the best time I think. It's exhausting but it's the best because it's extensive, it's like almost a retreat away, you spend so much time with each other, so many days and so much intense work and you get to see all the sides of everybody almost like this is your roommate. I really like the summer program.

As above, some features of positive developmental settings were strongly evident and others less so in any given practice account, but all wove together multiple features through a variety of specific techniques. The story of the director of a non-profit architectural foundation that partnered with the city school district to offer a course in urban design provides another example of how practitioners created positive developmental settings (Table 4.8). In this program, students placed with mentors in professional firms participated in a collective student-initiated project where they researched a proposed housing development and produced a documentary presenting their analysis of the issue.

Table 4.8. Interview excerpt illustrating multiple features of settings that promote positive youth development.

Features of positive developmental settings (Eccles and Gootman 2002)	**Interview excerpt**
Integration of school and community efforts (synergy between course and mentorships in professional firms)	… And once they get into the firms, the growth we see is just phenomenal. They go into companies and are treated like an adult and respond as an adult, which is just pure gold for a young kid … We had a kid who was just kind of moping around. He had gone to one of the engineering firms here in the city for his mentorship and wasn't sure of what he was doing until he went to a meeting where they were talking about some new seismic retrofitting equipment that the company might or might not buy. And they asked his opinion. "What do you think, Jack[1]?" He came back over that day; he didn't have to stop back at school but he came right back over, he was so excited, telling us all about it, "And so I said, 'Well, I think if it's a certain kind of building that's going to need it, and it'll save us money, it might be a good idea to purchase this.' 'Well, that's a good idea, Jack.' They liked my idea." And he just went on and on about it. And the kid has just done a 180. He is one of our most active students, just really involved in our project this year. And we've just been seeing that again and again and again. So the combination of working on a real-world project, something that they know has an impact on the community, and where their opinion is going to count, followed up with being in a professional environment every week for six hours, where the top professionals in the city take their time to show them what is going on and give them real-world tasks …
Support for efficacy and mattering (making a difference in one's community, responsibility, meaningful challenge)	
Opportunities for skill-building	[In the video project] what we encouraged the students to do was 'play your strength.' If you are a good writer, we would like you to work on the script. If you are comfortable standing in front of the camera, speaking, then that is what you should do. Other people might want to run the camera. Some people became good at handling the video editing, seemed to have a knack for that. … The research, everybody had to do research. There were certain things that we required everybody to do, just to fully invest them in the program. … So we let them kind of divide it up. But we made certain that every kid had a job to do and that they would do that job at a professional level. Once again, it kind of mimics what we see in the professional world, where an architecture firm has, not everybody is good at drawing plans. In a firm, there are going to be 40 different jobs that people are doing, a variety of things to bring a single project together.
Opportunities to belong (opportunities for meaningful inclusion)	
Support for efficacy and mattering (practices that focus on improvement rather than current performance levels)	… they learn that they are much more competent than they ever realized, that they've been kind of holding back, let's say, their skills. … Everything has to be done well. And they realize that they haven't been putting out that kind of effort, so they start doing it and find that they are really very capable. … We ran into, "Oh my god, you want me to do that again?" on the [video] editing. And that was an interesting process. At first, we told the kids, "Okay, you've got an hour of video here. We need you to get it down to five minutes." So the kids would put together five minutes worth of clips. We would run the clips, and they were disjointed and didn't make any sense. It was like, "Okay you have five minutes but it doesn't say anything. What was it you wanted to say? No you have to pick the most important five clips that complete your thought." "Oh. Well, you didn't tell me that. You just said, 'Five minutes.'" So, we would have to encourage them.

[1] Pseudonym

Conclusion

While this inquiry did not begin from a theoretical framework of youth development, the strong parallels evident in young people's reflections and practitioners' accounts led me to conclude that environmental action can be an important context for positive youth development. Youth spoke knowledgeably about subject matter related to their participation in environmental action (e.g., plant science in a community gardening program); however, youth reported that they most valued learning (e.g., initiative, teamwork) that can be understood as developing physical, intellectual, psychological, and social assets promoting well-being (Table 4.5). Environmental learning outcomes were but one component of the overall developmental experiences described by youth. Persisting in and overcoming challenges appeared to be an important dimension of the experience contributing to young people's development (Larson et al. 2005) as did experiential learning, adult guidance, and collective work (Table 4.6). Research that further investigates how youth develop through their participation in environmental action would contribute to the environmental education field, where little research has addressed developmental pathways, and to the youth development field, where little research has investigated organized youth activities involving environmental action.

Interviews with practitioners provided rich accounts of environmental action as a developmental context. Emerging themes were consistent with existing understanding of settings that promote positive youth development (Table 4.7). In addition to shared decision-making, a criterion for inclusion in the study, practice themes included: creating safe spaces; providing structure; building respectful, trusting relationships; bridging differences and creating

opportunities for all learners to contribute; setting clear, rigorous expectations; providing opportunities for meaningful contribution; supporting youth as they encounter new challenges; connecting youth with their community; and expanding horizons through novel experiences. Not every theme was present in every practice account but all involved the integration of multiple themes. Simply stated, these practitioners were doing good youth development work.

That environmental action serves as a positive developmental context is not a given, however. Poorly guided environmental action projects could lead youth to feel disempowered, overwhelmed by environmental problems, and incapable of making a difference (Jensen and Schnack 1997). Promoting positive youth development through environmental action requires passionate, talented, and dedicated adults who are capable of both organizing around environmental issues and effectively working with youth (Schusler, unpublished data). A foundation for successfully working with youth begins with understanding environmental action as a developmental context. This understanding can enable practitioners and researchers alike to reflect on environmental education through a broader theoretical lens that values an array of participant outcomes and embraces a more holistic approach to environmental education practice.

CHAPTER 5

ENVIRONMENTAL ACTION: INTEGRATING SCIENCE EDUCATION AND CIVIC ENGAGEMENT

"…thinking is a process of inquiry, of looking into things, of investigating. … It is seeking, a quest, for something that is not at hand. We sometimes talk as if 'original research' were a peculiar prerogative of scientists or at least of advanced students. But all thinking is research, and all research is native, original, with him who carries it out." — John Dewey, 1916

"Science is in my opinion just a very general word that describes everything we know, and everything we seek to learn."

— Teen participant in local environmental research and action, 2003

As evidenced by public debates about environmental controversies ranging from regulation of genetically modified organisms to global climate change, the media and citizens often lack the ability to critically evaluate the quality of scientific evidence. Furthermore, politicians may either intentionally distort research results or are themselves unable to critically assess scientific evidence and the implications of disagreement among scientists. This leads to further confusion among the general populace. For example, as evidence of global warming continued to mount over the last decade, some U.S. politicians drew upon the testimony of the small minority of dissenting scientists to support their stance against controls on greenhouse gasses. At the other end of the spectrum are citizens who uncritically support the positions of environmental organizations without evaluating larger consequences, such as being categorically opposed to genetically modified organisms without

considering potential positive environmental impacts of some new technologies.

Grappling with local environmental issues, which occur at the intersection of ecological, economic, social, and political systems (Dryzek 1997), can provide opportunities for young people to develop dispositions, understanding, and skills related to political and scientific literacy, both of which are crucial to participation in contemporary Western democratic societies. Participation in local environmental action, however, need not necessarily result in these outcomes. In this paper, I consider environmental action as an avenue for developing young people's capabilities for democratic participation as scientifically literate citizens. I provide philosophical justification for connecting civic and science education and describe parallels between civic education conceptualized as youth civic engagement and science education approached as inquiry-based learning. I argue that environmental action understood as participatory action research (PAR) (Hart 1997, Mordock and Krasny 2001, Driskell 2002, McClaren and Hammond 2005) occurs at the intersection of inquiry-based science education and youth civic engagement. I then explore the interplay of science education and youth civic engagement in ten empirical cases of environmental action programs taking place in schools and community organizations in New York State.

Why Political and Scientific Literacy?

Controversial environmental issues involve ethical, practical, and political questions that scientific knowledge cannot answer (Yankelovich 1991, Stern and Fineberg 1996, Fischer 2000). Although science-related public decisions require deliberation about values, such debates in the U.S. are

repeatedly framed in scientific discourses as disagreements over facts, which veil fundamental normative differences. In a controversy over fish and wildlife management in the eastern bay of Lake Ontario, for example, stakeholders with polar positions on the issue stated that management decisions should be "science-based" but disagreed in their interpretations of scientific studies. Furthermore, stakeholders' main source of information, the media, provided little context for understanding scientific data and failed to relay the complexity of the ecosystem. The situation involved complex, value-laden judgments and conflict about the adequacy of scientific knowledge and about basic goals and values (Schusler and Decker 2000). These characteristics, found in numerous public controversies, call for effective dialogue between technical experts and interested and affected citizens (Stern and Fineberg 1996, Fischer 2000). Often, however, crucial normative assumptions are buried in technical analyses with little opportunity to question or examine science itself (Fischer, 2000), thereby privileging the views of scientific or technical experts over those of the people most directly affected by public decisions.

Democracy requires public deliberations that incorporate multiple forms of knowledge by integrating scientific understanding with contextual understanding provided by local and practical knowledge[6] (Stern and Fineberg 1996, Scott 1998, Fischer 2000, Roth and Désautels 2004). Integrating local/practical and scientific knowledge in public deliberations requires that science "…be open to interrogation from a variety of perspectives and

[6] Fischer (2000, 146) defined local knowledge as "…knowledge about a local context or setting, including empirical knowledge of specific characteristics, circumstances, events, and relationships, as well as the normative understandings of their meaning." Scott (1998) described practical knowledge as a wide array of practical skills and intelligence, such as that of a traditional cultivator or experienced doctor, which are acquired through responding to a constantly changing natural and human environment.

therefore relativized in a democratic process where all forms of knowledge undergo equal scrutiny" (Roth and Désautels 2004: 155). This calls for scientists and technical experts who value the local and practical knowledge of lay citizens, as well as citizens who possess understanding and skills to critically question the role of science in society (Roth and Désautels 2004).

In this view, scientific literacy involves not only understanding scientific concepts and processes, but also the ability to recognize "…the power and utility of scientific work … *and* … its limitations in dealing with the kinds of problems for which its techniques are ill suited" (emphasis in original) (Scott 1998: 290). It entails the abilities to assess the value of knowledge in a particular context and to participate in the social negotiations that produce knowledge (Roth and Désautels 2004). Becoming scientifically and technologically literate is akin to acquiring "a certain autonomy," "a certain capacity to communicate," "coping with specific situations," and "negotiating over outcomes" (Fourez in Roth and Désautels 2004: 161-2). Likewise, political literacy — referring to the commitment, knowledge, and skills to participate in the political systems of power and decision-making in which people live (Fien 1993) — involves the critical capacity to make choices rather than accept the prescriptions of others (Freire 1973), hold experts accountable, and insert one's own knowledge into the public discourse (Fischer 2000). Political and scientific literacy increase the resources upon which one can draw to participate in public life.

Environmental Action: Integrating Civic And Science Education

The potential for developing political and scientific literacy through experiences that integrate science and action depends in large part on how

one conceptualizes these. Science is often misleadingly portrayed as value-free and apolitical, characteristics counter to civic participation. Yet, as I describe below, scientific practice and civic engagement share several characteristics, including questioning assumptions, understanding systems, considering alternative explanations, and debating critically within a community. Whether in discovering factors that affect a stream's water quality, or developing a strategy to influence local watershed management policy, *the habit of asking critical questions about social-ecological systems is an essential dimension of both scientific practice and civic engagement*. A review of pertinent literature on civic and science education illuminates the prospect of the integration.

Civic education is a complex enterprise involving a variety of cognitive, conceptual, and attitudinal strands (Torney-Purta et al. 2001). Approaches to civic education vary with different definitions of what it means to be a "good" citizen (Gibson 2001, Battistoni 2002, Youniss et al. 2002, Kirlin 2003). Battistoni (2002) identified twelve conceptual frameworks of citizenship within the social sciences and other disciplines. Youth participation in environmental action reflects civic education based in the traditions of participatory democracy, public work, and social justice (Battistoni 2002) because it includes youth directly in democratic processes, involves collective action toward some public purpose (e.g., creating a community garden), and ideally addresses the root causes of problems.

Young people's involvement in environmental action is a form of youth civic engagement (Camino and Zeldin 2002), one approach to civic education. Camino and Zeldin (2002: 214) defined civic engagement as "being able to influence choices in collective action" and recognized that, long a bedrock of

democracy, citizen engagement is the purview of every citizen, not only officials and professionals. Skelton and colleagues (2002: 9) defined youth civic engagement as “young citizens developing civic skills and habits as they actively shape democratic society in collaboration with others.” Pathways to youth civic engagement (e.g., public policy consultation, youth organizing, service learning) seek to concurrently promote youth development and community change (Camino and Zeldin 2002, Balsano 2005, see Chapter 2). Rarely can youth go it exclusively alone; rather, youth civic engagement is characterized by partnerships in which adults serve as allies and advisors (Camino and Zeldin 2002, see Chapters 4-5). Through civic engagement young people can develop understanding of civic concepts, attitudes supporting democratic practices, and civic skills, including those related to critical thinking, ability to assess information sources, communication, deliberation, public problem solving, civic judgment, civic imagination, community/coalition building, and organizational analysis (Gibson 2001, Battistoni 2002). This learning, in turn, can increase young people’s ability to exert influence in public affairs (Newmann 1975).

Like civic education, approaches to science education vary with different ideas about the relationship of science to society and correspondingly the purpose of science education. If an aim of science education is to help learners manage their own life world, then the common notion of scientific literacy as a set of procedures and body of declarative knowledge to be cognitively acquired by individuals requires revision (Roth and Lee 2004). A person cannot be sufficiently knowledgeable in every area of expertise needed for personal and collective decision-making, but one benefits from the ability to critically assess knowledge from other sources. From this view, it makes

sense to consider scientific literacy in terms of the “right use” of specialists, information sources, and models of thinking (Fourez 1997 in Roth and Lee 2004). Jenkins (1994) argued for science education that views science in the context of specific social purposes (e.g., related to employment, health, or environment) and that values knowledge for action rather than for its own sake. In this view:

> … scientific knowledge becomes as much a resource for helping students … make sense of their role as actors in a social world as a powerful, external set of procedures for comprehending and shaping the material world. Moreover, scientific knowledge is but one resource called in aid of this purpose, albeit often one of impressive scope and predictive power (Jenkins 1994: 604).

The science education reform movement in the U.S. emphasizes the importance of inquiry-based learning. According to the U.S. *National Science Education Standards*:

> When engaging in inquiry, students describe objects and events, ask questions, construct explanations, test those explanations against current scientific knowledge, and communicate their ideas to others. They identify their assumptions, use critical and logical thinking, and consider alternative explanations (NRC 1996: 2).

Inquiry-based science education reflects pedagogy in which the teacher is a coach and facilitator rather than dispenser of knowledge, students are self-directed learners rather than passive receivers, and student work takes the form of student-directed learning rather than teacher-prescribed activities (Anderson 2002). Inquiry teaching varies in the degree of teacher-directed structure from “guided” to “open” inquiry, in which learning becomes more self-directed (NRC 2000).

Inquiry-based science education involves some of the same dispositions and skills required for civic participation, including questioning, problem solving, planning, decision-making, and discussion with peers. It also involves an understanding of the “Nature of Science,” or that science is

empirically based, socially and culturally embedded, tentative, subjective, and necessarily involves human inference, imagination, and creativity (Lederman 1998). Inquiry-based learning can involve conducting investigations using experimental design. Equating inquiry solely with doing experiments, however, provides students with a narrow and distorted view of scientific inquiry (Lederman, 1998). Young people's participation in local environmental action can involve a wide range of investigations, including conducting experiments, descriptive and correlational research, and social inquiry.

Fundamentally, inquiry-based science education and youth civic engagement both involve thinking critically about systems (e.g., ecological, economic, social, political). A complex and contested construct, critical thinking is often viewed as a higher-order cognitive skill involving certain mental processes or procedural moves. This view proves problematic because it lacks a normative dimension (Bailin 2002) and ignores the attitudes, dispositions, and judgment involved in critical thinking (ten Dam and Volman 2004). Bailin argued for an explicitly normative conception of critical thinking for which the pedagogical focus shifts from issues related to application of processes and acquisition of skills to "the question of what one needs to understand in order to meet the criteria of good thinking in particular contexts" (Bailin 2002: 368). Ten Dam and Volman (2004: 372) draw on social constructivist educational theories in their definition of critical thinking as "acquiring the competence to *participate* critically in the communities and social practices to which a person belongs (italics in original)." This view recognizes that the thinker must possess a constellation of resources (Bailin 2002) that includes sources of evidence or forms of verification (e.g.,

experience, cares and commitments) beyond the rationalistic epistemology typically associated with critical thinking (ten Dam and Volman 2004).

Narrow conceptions of science as a body of facts and civics as fulfilling one's obligation to vote do not reflect the potential for integrating science education and civic engagement. Rather, an area of overlap exists. In theory, environmental action occurs at the intersection of inquiry-based science education and youth civic engagement (Figures 5.1 and 5.2). Empirical evidence from specific cases supports this conception of environmental action. Roth and Lee (2004) described science education in which community participation was requisite in a case study of students and other community members co-producing knowledge about a local creek. In this "community science," scientific literacy was a collective property and scientific knowledge was one of many knowledge sources (e.g., political science, economics, aesthetics, philosophy, common sense) that informed community decisions. Fusco and Barton (2001) described how teens in an after school science education program were producers of knowledge in the transformation of an inner-city vacant lot into a community garden. They observed that when youth, science, and community interacted, change occurred within individuals, within the physical and social environment, and within the culture of science education in terms of what counted as science, to whom it was relevant, and for what ends (Fusco and Barton 2001). Science and action become inextricable when the aim of science education is not mentally isolated changes in individuals' knowledge, but a "nexus of interrelated and situated shifts in learning and development" (Fusco and Barton 2001: 872) that occur as learners participate in the social negotiations that produce knowledge relevant to community problems.

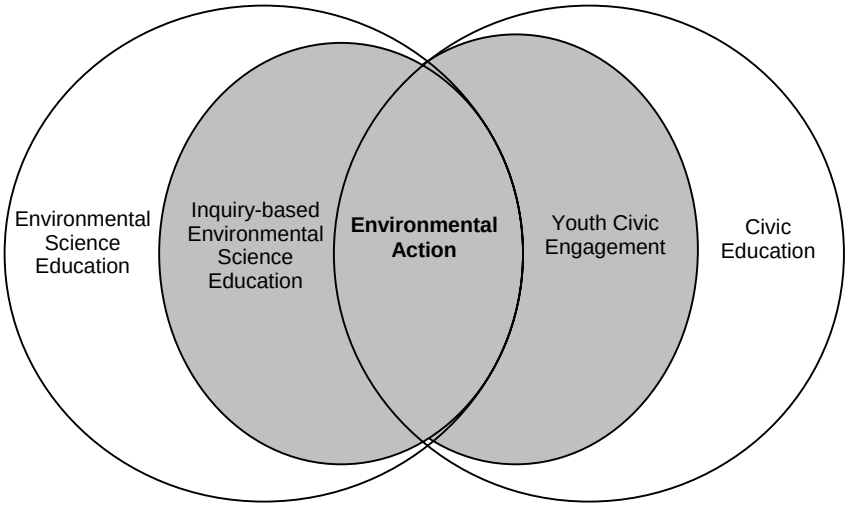

Figure 5.1. In theory, environmental action occurs at the intersection of inquiry-based environmental science education and youth civic engagement.

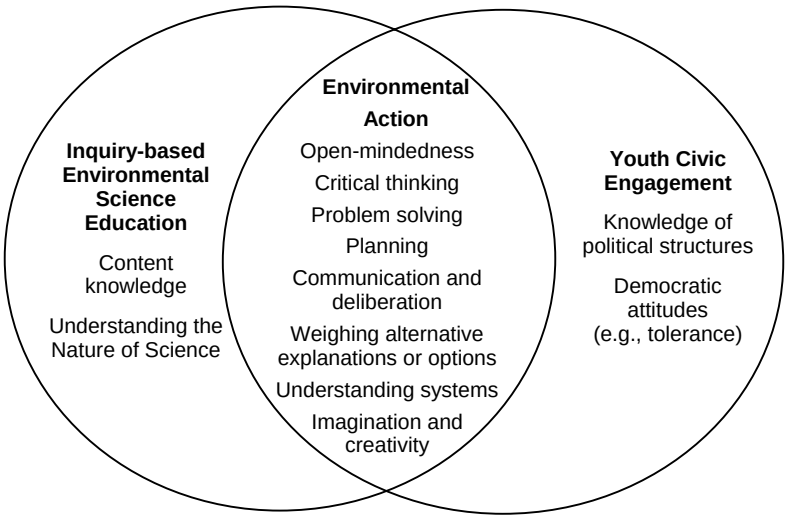

Figure 5.2. Environmental action involves dispositions and skills characteristic of both scientific practice and civic engagement.

Environmental Action as Participatory Action Research

Some scholars contend that a dominance of scientism (i.e., privileging science over other interpretations of life and the natural sciences over other

fields of inquiry) in environmental education (EE) gives learners knowledge about environmental problems but neglects the social and societal perspectives involved in questioning the root causes of problems and envisioning action possibilities for solving them (Jensen and Schnack 1997). At the same time, others argue that a rhetoric of action-taking in EE discounts the place of science in the construction of knowledge and understanding of environmental issues (Bishop and Scott 1998). Certainly cases of both EE dominated by scientism and EE dominated by activism with disregard for scientific evidence exist; however, this science-action divide dissipates when one conceptualizes environmental action as a form of participatory action research (PAR) in which inquiry informs and evaluates action in an iterative process (Hart 1997, Mordock and Krasny 2001, Driskell 2002, McClaren and Hammond 2005).

PAR promotes broad participation in the research process and supports action in solution of collective problems. It involves diverse stakeholders in the construction of knowledge and bridges local/practical and scientific knowledge to generate new understanding that can contribute directly to improving the situation at hand (Greenwood and Levin 1998, Deshler and Grudens-Schuck 2000). In this study, environmental action often took the form of PAR in which social and/or scientific inquiry was essential to informing and evaluating action in an iterative process (see Chapter 2). Understanding environmental action as PAR recognizes the civic dimensions of participation and action as well as the scientific dimension of research. Below I further describe each of these dimensions as well as critical reflection, another central dimension of environmental action, in my view.

Participation

People learn to participate in democracy through the exercise of democracy (Pateman 1970, Freire 1973). Participation in environmental action provides opportunities to experience democracy in authentic situations where youth can contribute and influence outcomes. Participation occurs in many forms with varying degrees of influence exerted by participants. Some seemingly participatory processes are deceptive. Decoration, tokenism, and manipulation do not meaningfully involve youth but rather advance pre-determined adult agendas (Hart 1997). Genuine forms of participation, such as consultation and shared decision-making, are distinguished by honesty and clarity about the extent of young people's power and the opportunity for youth to choose to participate to the maximum of their ability and interest (Hart 1997). Youth participation in environmental action reflects a fundamentally different relationship between young people and adults – one that involves shared decision-making power – than that typically prevalent in U.S. schools, youth programs, and communities (see Chapter 3). Through participation, youth can learn civic concepts, such as decision-making structures, and skills, such as communicating and negotiating, that increase their ability to influence public affairs.

Action

Schnack (1994:190, in Simovska 2000:30) defined *action competence* as the "capability – based on critical thinking and incomplete knowledge – to involve yourself as a person with other persons in responsible actions and counter-actions for a more humane world." Theoretically, two criteria distinguish action from activity or behavior. Ideally, action is intentional and

targets the root causes of a problem (Jensen and Schnack 1997). For example, youth participation in an activity initiated and organized by adults, such as an environmental clean-up, while beneficial would not necessarily constitute action because it lacks deliberate choice or intent of the young people involved. Jensen and Schnack (1997) also argue that such a clean-up would not constitute action because it focuses on symptoms (e.g., removing trash and debris) rather than causes of environmental degradation. Actions that do not directly address root causes have the potential, however, to contribute indirectly to solving environmental problems (Bishop and Scott 1998). For example, a clean-up initiated by youth might draw public attention to the issue of littering or illegal dumping, which might lead a community to consider other actions to eliminate these sources of degradation. When youth take action to effect change they can acquire skills related to planning, public speaking, fundraising, and organizing community support, as well as learn about civic-related concepts such as public purpose and power. Regardless of whether or not their efforts are successful, engaging in collective action can enable youth to think critically about the kind of world they want to live in. It also can enhance their understanding of social, economic, and political systems as they identify opportunities for and obstacles to realizing their visions.

Research

Because it occurs at the interface of natural and social systems, young people's environmental research can involve a suite of quantitative and qualitative research methods ranging from water quality and soil analysis to interviews and participatory mapping (Doyle and Krasny 2003). Youth can

engage in multiple aspects of the research process, including defining research questions, collecting and analyzing data, interpreting results, and communicating conclusions. Thus, the research dimension can provide opportunities for youth to learn both science concepts (e.g. non-point source pollution, epidemiology of lead poisoning, changes in land use over time) and skills (e.g. aerial photo and map interpretation, Geographic Information Systems, interviewing, document analysis, synthesizing and communicating results) (Mordock and Krasny 2001). Research serves to inform and evaluate environmental action and, consistent with Bishop and Scott (1998), can also constitute action (Table 5.1).

Table 5.1. Research as forms of environmental action based on Bishop and Scott (1998).

Environmental Actions Classified by Bishop and Scott (1998)	**Examples of Research Described by Practitioners Guiding Youth in Environmental Action (see Chapter 2)**
Direct Resolution of environmental problems – The main purpose is directly to resolve the causes of the environmental problem	Students installed green roof modules on top of their urban school to conduct experiments on the effects of varying plants, substratum, etc. on temperature and stormwater capture to inform decisions in green roof expansion. *Students' scientific investigations directly addressed the problem of stormwater runoff from the school's roof.*
Direct Influence and Indirect Resolution of environmental problems – The twin purposes are directly to influence others and, through this, to contribute indirectly to the resolution of the problem's causes	Youth evaluating their neighborhood through action research identified litter as a concern. They presented their findings to local officials, who agreed to provide solar-powered compacting trashcans where none previously existed. *Youth research influenced local officials to address the litter problem.*
Indirect Influence on others to resolve environmental problems – The main purpose is to influence others to contribute to the resolution of the environmental problem	Demonstrating their stream monitoring techniques at an Earth Day event, a teen club inspired youth from another location to learn how to monitor the bay in their community. *Youths' ongoing water quality monitoring inspired others to take an interest in water quality issues.*

Critical reflection

Environmental action as PAR involves a cyclical process of inquiring, acting, reflecting, and adapting. Reflection – thinking about what one is doing to more fully understand its meaning – is essential to both science and civic education. Lederman (1998) observed that students do not implicitly learn about scientific inquiry and the Nature of Science by simply doing science. Such understanding is better facilitated through an 'explicit reflective approach' in which the educator explicitly points out aspects of scientific inquiry and the Nature of Science highlighted by students' experiences and encourages students to reflect on the implications that such aspects have for the way they view scientists, scientific knowledge, and the practice of science (Lederman 1998). Similarly, political knowledge and civic skills do not automatically develop from the experience of civic engagement or community service (Battistoni 2002). In this context, one particular approach for encouraging critical reflection on civic engagement is 'conceptual organizing'. This involves the explicit introduction of political ideas (e.g., citizenship, democracy, freedom, power, diversity, accountability) to challenge youth to reflect on and draw meaning from their actions, consider the broader implications of their work, and situate it in a larger public sphere (Boyte *et al*. 1999).

Environmental action as PAR: An Illustration

The yearlong "Landfill Project," co-facilitated by high school teacher Linda Tompkins and myself, illustrates environmental action as a form of PAR in its integration of participation, action, research, and reflection (Table 5.2). The project involved sixty biology students age 14-16 of mixed academic abilities in a rural high school in upstate New York. Spurred by a controversy

over possible expansion of a nearby landfill, students decided to investigate the environmental, economic, and social impacts of the landfill on their community. The students, working collectively under the guidance of their teacher, myself, and other community members, defined the following goal: ‘To learn and share how [the] Landfill affects our community and others beyond it.’

To realize their goal, students (with adult guidance) gathered information on environmental, economic, and social impacts of the landfill on their community, took a field trip to the landfill and to a National Wildlife Refuge downstream of it, invited guest speakers into the classroom, and developed posters, fact sheets, and press releases to share with the community. The students also initiated and organized a panel discussion reflecting diverse viewpoints so that other students and community members could learn about the landfill. Panel members included a landfill representative, environmentalist, community educator, town supervisor, and engineer from the state regulatory agency. Finally, recognizing that youth voices were largely absent from discussions around the future of the landfill, the students conducted a survey of their peers’ knowledge and opinions about the landfill and shared their results in public presentations to community groups (Tompkins 2005).

In the Landfill Project, participation was evident in students’ selection of the project itself, reaching general agreement on the project goal, and contributing to achieving that goal through myriad activities. Action was intentional in that students initiated and largely directed the panel discussion and survey, although the action undertaken in this project did not address root causes of solid waste problems. Research took the form of secondary data

collection from the library, internet, and local experts to learn about the environmental, economic, and social impacts of the landfill on their community. In addition, the students conducted original research through their survey. Reflection was a frequent component of the project in the form of class discussions and journal assignments (Table 5.2).

Table 5.2. Dimensions of Participatory Action Research illustrated by student activities in the Landfill Project.

Participation	• Debating and agreeing on a process for selecting a community-based research project • Collectively developing a mission statement and timeline for achieving it • Soliciting school board support for project and funding for field trips • Working in teams to plan and conduct project tasks, such as preparing a press release, inviting guest speakers, developing informative posters for display at panel discussion • Creating opportunities for community learning through panel discussion • Contributing research results on student attitudes through presentations to community groups
Action	• Initiating ideas for action (e.g., panel discussion of community experts, survey of student attitudes) and bringing them to fruition
Inquiry	• Conducting library and online research about landfills • Asking own questions of community experts • Designing and implementing survey of students' attitudes • Debating interpretations of survey results • Presenting project to peers at a multi-school research congress • Communicating results to community groups
Critical reflection	• Participating in class discussions reflecting on what it means to be a community member and how social science affects people's lives • Writing in response to questions posed in journal assignments

Research Questions

Environmental action as PAR integrates youth civic engagement and inquiry-based science education and can contribute to developing young people's political and scientific literacy. One might wonder, however, whether such cases are isolated examples – the fruits of a few talented science educators with a passion for community activism. This study sought to

understand across several cases of environmental action, including some in which science education was not a primary goal, the interplay of science and community action. I explored this intersection through the eyes of youth participants and the practitioners guiding them to answer the following questions:

- How do youth perceive science and civic engagement in the context of their participation in local environmental action?
- What do practitioners' accounts of guiding youth in local environmental action reveal about the potential and challenges of integrating science education and civic engagement in a single classroom or youth program?

These questions were among several explored through phenomenological inquiry involving interviews with youth and practitioners (teachers and non-formal educators) partnering in local environmental action (see Chapters 2-4).

Methodology

I chose a phenomenological approach because my interest was in understanding the themes of science and civic engagement in the context of environmental action from the perspectives of participating youth and the practitioners guiding them. Phenomenology presumes that through dialogue and reflection we can understand the meaning or essence of an experience for those experiencing it (Tesch 1990, Creswell 1998, Schram 2003). Data collection involved interviews with youth (individually and in groups) and practitioners, including teachers, extension educators, youth development specialists, community organizers, and program directors.

Interviews with youth

A co-researcher (J. Simon) and I conducted ten group interviews (Patton 1990, Morgan and Krueger 1998) that included a total of 46 young people participating in environmental action through nine schools or community organizations, which I refer to as “programs” for ease of reference, in New York State. I identified eight programs through peer referral and one program by its receipt of a national environmental excellence award. Program goals were multi-fold and did not necessarily include the integration of science education and civic engagement as a primary goal. They provided useful contexts to explore this intersection, however, because they engaged youth in environmental action. In addition to these group interviews, individual interviews conducted with youth in evaluation of the Cornell Environmental Inquiry Research Partnership (CEIRP) informed my interpretations. The evaluator interviewed eight students participating in the Landfill Project co-facilitated by their teacher and myself (K. Mullen, unpublished data).

In all, group and individual interviews included 54 youth (Table 5.3) participating in ten diverse environmental action programs (Table 5.4). Each group interview included three to seven youth selected by the teacher or program leader. The young people interviewed were often those most actively engaged with the program or project; thus, the data do not reflect the full diversity of experiences among participating youth. *My intent is not to generalize but rather to share provocative insights from these young people’s words around the intersection of science education and civic engagement in the context of their participation in environmental action.*

Each group interview began with general questions about young people’s experiences and then moved to more focused questions encouraging

their reflections on what and how they learned, how their participation influenced their perceptions of themselves in relation to their community, and what connections they saw between their environmental action experience and science (Appendix B). Throughout, the interviewer probed for specific examples. Group interviews ranged in duration from 18 to 65 minutes, with most lasting around a half hour. Similar to group interview questions, the CEIRP evaluator inquired about students' roles and experiences in the Landfill Project, how the project differed from their other science classes, what they learned through their participation, and how the project influenced their perceptions of science and scientists. Interviews were digitally recorded (with the exception of one where detailed notes were taken) and transcribed verbatim. I analyzed interview data across sites using HyperResearch software to aid in data management.

Table 5.3. Demographics of youth interviewed.

Gender	28 girls and 26 boys
Age	9 to 18 years
Race/ethnicity	4 Asian, 9 African-American, 11 Latino, 30 white
Location	5 suburban, 16 rural, 10 small city, 23 urban (large city)
Educational setting	29 formal and 25 non-formal

Table 5.4. Characteristics of contexts in which youth interviewed[1] participated in environmental action (54 youth, 10 programs).

Program description[2]	**# Youth Inter-viewed**	**Educa-tional setting**	**Location**	**Focus of action**
Program A - Community-based youth development program in which participants maintained a community garden plot and contributed data to a citizen science program on urban weed management.	7	Non-formal	Urban	Community gardening
East New York Farms! - Community development program in which youth employed as interns participated in agricultural learning and leadership training, growing food for the community, managing a neighborhood farmers' market, and educating residents about healthy food.	3	Non-formal	Urban	Food systems
Growing Green - Community development program in which youth employed during the growing season built, planted, maintained, and harvested gardens and marketed and sold their produce. Youth were also involved in business planning and community outreach.	3	Non-formal	Urban	Food systems
TRUCE Nutrition and Fitness Center - Community-based youth development program in which youth participated in developing fitness and nutrition related programming. After conducting a neighborhood survey that documented lack of availability of fresh fruits and vegetables, youth employed by the program reclaimed an abandoned, city-owned lot, where they developed a vegetable garden and donated produce they grew to a community kitchen.	4	Non-formal	Urban	Community gardening, open space preservation
Caroline Youth Services - Community-based youth development program in which high school students employed through the program guided middle school students in organizing community events and service projects.	3	Non-formal	Rural	Community beautification, community building
Lansing Youth Services - Community-based youth development program in which middle school students produced a “Green Homes” documentary featuring local residents.	5	Non-formal	Rural	Green building, media

Table 5.4. (continued)

Pine Bush Project, Farnsworth Middle School – Middle school science class in which students conducted scientific inquiry in conjunction with action to restore a local, globally rare ecosystem. After-school and summer program in which students managed a butterfly house (where butterflies were reared for introduction to the wild), gardens for native plant propagation, and public outreach programs, including tours and day camps for younger children.	5	Formal	Suburban	Habitat restoration, wildlife conservation
Sustainability Initiatives, Lehman Alternative Community School - High school ecology class in which students conducted individual and collective action projects in conjunction with their course work. Among many projects undertaken were advocating for the school district to install a solar electric system; designing and building a raised garden bed at a home for adults with disabilities; assessing the quality of woods adjacent to the school for wildlife habitat; and developing and teaching a sustainability curriculum to elementary school students.	10[3]	Formal	Small city	Multiple
Roof Garden Project, School of the Future - High school science class and after school club that designed and built a wheelchair accessible roof garden. At the time of this study, students were engaged in re-design of the space and scientific experiments around the effectiveness of green roof modules with varying design parameters (e.g., plant types, soil medium and depths) for controlling the building's temperature and reducing its stormwater runoff.	6	Formal	Urban	Roof garden, green roofs, sustainability
Landfill Project, Mynderse Academy - High school biology class in which students researched the impacts of a nearby landfill on their community, organized a panel discussion to educate others about diverse points of view on the landfill's proposed expansion, and surveyed peers to inform community groups about young people's opinions on the issue.	8	Formal	Rural	Solid waste management

[1] T. Schusler conducted eight interviews with groups of youth in seven programs, J. Simon conducted two interviews with groups of youth in two programs, and K. Mullen conducted individual interviews with youth in one program.

[2] Based on program materials and interviews with teacher or program leader.

[3] Two groups of 5 youth each were interviewed at this site.

Interviews with practitioners

In semi-structured, open-ended interviews, my co-researchers[7] and I encouraged the teachers, extension educators, community organizers, and others guiding youth in these environmental action programs to share narratives of their practice. This approach presumed that narratives would illuminate tacit knowledge and theories embedded in the practice accounts (Dodge et al. 2005). Forester (1999) and others (e.g., Chase 1995, Hart 2003) demonstrated the value of narratives for revealing the complexity of practice; enabling readers to see their own practical situations and possibilities anew; and leading to fresh lines of theoretical inquiry.

The interview sample included nine professionals (3 teachers, 6 non-formal educators; 5 working in urban communities, 2 rural, 1 suburban, and 1 small city; 5 women, 4 men; 2 persons of color, 7 white). Using a general interview guide with an outline of issues to be explored, I adapted questions in wording and sequence to specific respondents in the context of the actual interview (Patton 1990). Each interview began with general questions about the individual and her work followed by the detailed telling of a specific success story (Appendix B). Throughout, I posed context-appropriate probes to solicit additional details and encourage the interviewee's reflections on her practice. The interview concluded with questions designed to gather additional perspectives not yet captured.

Interviews lasted 33-86 minutes with most lasting about an hour. All but one were audio recorded and transcribed by a professional clerical assistant. I reviewed transcripts for accuracy with the original recordings, and the

[7] Two researchers assisted in data collection under my guidance: Jamila Simon and Mike Simsik each conducted one interview. I am grateful for their assistance.

transcribed text became the data used for analysis and interpretation. Because of my theoretical interest in the integration of science education and youth civic engagement, I searched interview transcripts for relevant data, either illustrating synergies or contradictions. The theoretical framework described above served as a “sensitizing concept” (Patton 1990) for data interpretation. Elsewhere I have presented themes that emerged more inductively from the data (see Chapters 2-4).

The Interplay of Science Education and Civic Engagement Evident in Practitioner and Youth Descriptions of Environmental Action

Science and civic engagement intersected in different ways in the accounts of practitioners and youth partnering to create positive environmental change. Below I describe ways in which science came into play in environmental action described by practitioners guiding youth in the ten programs. I then share evidence from young people’s descriptions of their environmental action experiences of science and civic learning and discuss the area of overlap.

In some programs, scientific knowledge was essential to the success of environmental action, such as organically growing food for a farmers market. Thus, in the course of a project, youth learned about soils, plant science, or composting, for instance. In some programs, scientific experiments informed or evaluated action. For example, a science teacher described investigations conducted to inform and evaluate restoration of the globally rare Pine Bush ecosystem, including habitat for the endangered Karner Blue butterfly, which is an obligate species of Blue Lupine:

> We did one study called the ‘Effect of Exclosures on Blue Lupine and Deer Herbivory.’ And the students actually built a 40 x 40 fenced exclosure … And then they went back and studied the amount of deer herbivory inside the exclosure and outside the exclosure by looking at the number of lupine stems. Another big project we do is girdling. The kids go out and girdle invasive Aspen trees and then students who I have two years later will go back to that area and compare how many trees are still up and how open the area is. And to see if the Aspens are actually recloning of if it's resprouting or if it's really clearing the area. We did a tremendous experiment on the scarification of lupine seeds. We sent to the top ten experts in the county on lupine and got eight different ways to scarify. And so the kids ran the eight experiments and concluded which method was best for scarification. And we presented that data back to the eight scientists … they're real life, real value experiments that we do.

In other cases, social inquiry enhanced understanding of a problem and helped chart a course of action in solving it. For example, a coordinator at a community-based youth program described how a neighborhood survey conducted by youth highlighted the need for increasing local access to fresh produce:

> So the survey was two-fold: one to familiarize ourselves … with the community, but we also use it as an opportunity to survey what is the state of affairs nutritionally in the community. And to have that serve as a premise that drives and underscores the significance of the [community garden] work … in terms of growing food. And for me, that’s really key for what I’m trying to do here … I try to take … a basic nutritional literacy grasp, the food guide pyramid, understanding the ‘killer 3’ of fats, sugars and salts, and what are the benefits, what are the downsides of that. And then looking at how you can act upon and in an informed way engage in healthier choices as far as what you eat. And then looking at how you can do that, if choices mean, what you do in the community to actualize those choices. But there’s a contradiction going on in terms of the access. This gardening program ... just weaves itself very well into what I’m trying to do, in terms of getting something from basic understanding to looking critically at maybe the contradiction between what you’ve come to understand and how you come to implement that understanding, and what initiatives – to the extent that we … just literally take an initiative to grow food. This is what I’m trying to teach, you take something, you get a basic understanding, then you apply that understanding to a problem, look at the resources to address that problem, and see where there’s a mismatch.

Whether as biological/ecological or social investigations, science in the context of environmental action involved a systematic approach to understanding and addressing a specific human purpose (e.g., primary social inquiry about environmentally conscious building practices in the production of an educational video, secondary data collection about a specific plant's growing requirements in the creation of raised garden bed for community beautification).

Science teachers viewed environmental action as a context that made students' science education more meaningful. One reflected:

> … it allows me a forum to make their learning meaningful. I firmly believe that, I mean I can teach bookwork but it doesn't make it real and [this project] has allowed me to create a living laboratory. A place where kids can experiment, where we can experiment and it's teaching science as science. Not just modeling science but actually doing science.

Science teachers also valued environmental action as a context in which youth could develop as citizens contributing to more sustainable communities (see Chapter 2). Another teacher's words illustrate:

> … a young woman who just got through studying that incredible detail [of the interconnectedness of natural ecosystems] … can feel really genuinely good within herself having designed and built a raised bed garden for vegetables for a group of disabled adults across town. And does that make our county more sustainable? And her answer would be yes. In a very small but very clear way the answer is yes, there's a little bit of self-sufficiency, there's a little bit of bioregionalism. We used black locust that was local instead of pressure treated stuff … it's thoughtful. It's putting her into a more sustainable mode and it's inviting some other folks, a small number but significant number of folks to also be in that mode …
>
> … [students in their written evaluations] really talk about … they feel a much heightened awareness I think and if you couple that, a much heightened awareness about environmental health of the planet, of the school, of themselves, and if you couple that with a feeling of being somewhat empowered, that's what we're after.

At times, in school classrooms, specific science curriculum goals and the goal of engaging youth in community action conflicted due to insufficient time. One teacher said:

> I threw my whole population unit that I wanted to teach out the window and said, 'You know guys we're about this far into the population unit that I thought would be a nice part of this class and it ain't going to get taught, it's gone.' And again mixed reviews, some kids were really disappointed by that but realized okay that's what we're going to do and there's good reason for it so we'll go with it.

Integrating science and community action in school classes seemed most complementary in the context of a single, collective action project in which students investigated discrete questions contributing to overall project goals. Another teacher explained:

> Because exhibitions at our school in science are supposed to be experiment based, [the action project] makes it really easy. Where sponsoring 25 kids doing all kinds of their own independent experiments is overwhelming, this makes it manageable. If ten of my kids will adopt this as their project, then that's that. And then I can deal with the other ones. So we're finding at the school we need more things like this [project] that can be springboards for lots of research.

In non-formal settings, science education was not typically a primary goal; rather, science served youth and community development goals. For example, one youth development specialist viewed garden-based scientific activities as an opportunity to help youth learn to follow instructions:

> Many kids … had a lot of problems following instructions. Our kids are coming from families with a lot of violence … and it's kind of rebellious, 'I don't want to do this, I don't like to do that, why I have to do this.' … if we are involved in a different activity where instructions are not taken as instructions, you are willing to do it … So I thought that it could be a good idea, through this unstructured and at the same time structured activities, we were going to be able to work on this behavior.

A community organizer's words reflect a goal shared by others in community organizations who sought to develop youth as community leaders and agents of social change:

> [We're] … providing them with the resources to critically analyze their own lives within their community and be able to understand that they can have the potential to make real change in their lives and their community. Because I think a lot of times people become very disempowered and don't really acknowledge their abilities in life so I think it's really important to encourage people to understand their capabilities.

Science Learning

Young people's descriptions of their experiences suggested that participation in environmental action contributed to science learning by enhancing their motivation and increasing their scientific content knowledge, understanding of the inquiry process, recognition of the complexity of science, and/or appreciation of the relevance of science to their lives. Youth spoke knowledgably of scientific concepts (e.g., plant science, soils, butterfly metamorphosis, nutrition, energy efficiency) related to their projects in all but one program.[8] In two programs, both school science classes, students' descriptions of their activities also demonstrated solid understanding of scientific inquiry in terms of designing and conducting scientific experiments, in one case, and posing questions, developing hypotheses, collecting data, and debating possible interpretations of that data in a social science survey, in the other case.

Perhaps of greater interest, however, is how participation in environmental action influenced some young people's perceptions of science. Students involved in environmental action through school science classes offered the unprompted observation that their experience made science more

[8] Youth in one program (included in this study because they designed and built a raised garden bed for community beautification) demonstrated limited environmental science knowledge. This was not surprising, however, because the environmental action project was one of many community service projects organized by these youth, most of which were not environmentally focused.

relevant. Interviews with students in the Landfill Project also suggested, in that particular case, that students developed appreciation for the complexity of science and its relevance to society. The following examples from interviews with youth illustrate:

Understanding scientific content (e.g., relationship of environmental pollution and human health)	I'll say the garden could influence the community because if we have, because you know how people in the world have asthma and how they like have asthma attacks by breathing in smokes but then how plants give off oxygen when you give them like carbon dioxide. If we had like more plants, we could have like there would be more oxygen for kids with asthma to breathe because then they won't be, because some kids [with] asthma be dying in the world and that's because there's a lot of trucks and cars that be giving off smoke and it's bad for them to breathe it in but if we had, when the plants give off the oxygen, it will be easier for them to breathe… – TRUCE participant
Understanding science process and the Nature of Science (e.g., science is empirical, tentative)	I feel like [the Roof Garden] ties in with science because when you have to come up with a hypothesis, you have to set up experiments, 'Okay what's going to be good?' You have to do observations. And it's not like when you do like a little mini lab you're doing it for a week. This is like a really big lab, you're doing it for months and months and months. And even after years it still can't be perfect but so it's like it ties into science just perfectly. – Roof Garden participant
Feeling that science is more relevant	… it really [put] the class in context and made it so relevant. Our homework was enacting change in our community ... it really makes it part of active life, not just tasks like studying meticulous vocabulary sheets. It made me think about the issues deeper than I would have in a typical 40-minute class. – Sustainability Initiatives participant

Recognizing complexity of science	… my dad's a chemist … and I always think he does too much work. He's spending night after night. And now that I've done this project, I sort of understand how it can get so unraveled. … now I understand what they go through. Every day is like an adventure. I'm amazed at how much information you find out. – Landfill Project participant
Appreciating role of scientists	It made me more aware of what people do and how important people's jobs in the scientific aspect are. When we talked to those engineers, like, that whole landfill depends on them and how they can design it and use their background like they need to know a lot, they need to know math as well as science. And they need to put like their names on sheets of paper that say this is safe for people. And if they don't design it the right way they can't do that, and so it really made me appreciate all the things that science can do for you in a job in the community in all kinds of settings. – Landfill Project participant

Among students in science classes, a common sentiment was that actually doing rather than simulating science, conducting research with the goal of making a difference in their community, and engaging in hands-on activities made science more meaningful. In addition, youth in non-formal settings described connections between their activities and science and demonstrated some scientific understanding in all but one program in the context of their participation in environmental action.

Civic Learning

To view environmental action primarily as a context for motivating youth and enhancing learning about scientific content, process, and the Nature of Science, however, discounts its civic dimensions. Most striking in young people's descriptions of their experiences with respect to civic engagement were the ways in which youth spoke of their activities in the context of a larger

public purpose and of themselves as producers and contributors to their communities. In every program, youth expressed positive feelings about doing something good for their community.

> You spend a lot of time helping too. You have to spend a lot of time learning, you have to spend a lot of time trying to teach other people. And that made me feel really good, that I could do something to help. – Pine Bush Project participant

> I'm happy every time I walk down the street and I see like one of Growing Green's gardens, I feel happy that I helped. – Growing Green participant

Furthermore, youth in seven programs explained that their participation led them to view their roles as community members differently in that they now viewed themselves as producers and contributors.

> Well for me it was like before being a good community member meant like not doing bad things, you know, not getting into trouble, or just basically being a good kid, but now it's like actually doing something to help. – Caroline Youth Services participant

> Now I feel like I'm one of the very few trying to bring back something positive to East New York. And it's helping, a lot of people come out to our farmers market, which we have every Saturday, it opens June 28. And like it's developing our community, it's slow but we're making change, we're making progress. – East New York Farms! participant

In addition, youth described how their experiences contributed to the development of specific dispositions and skills that enhance one's capability to participate in civic life, as illustrated by the examples below.

Learning to work with others	I think the most important thing I have learned is to try and stay calm and be patient with people. – Lansing Youth Services participant
Valuing diverse points of view	… and it was interesting to hear a lot of people's point of views on [the landfill]. We didn't know they were so diverse. Like we thought pretty much everyone hated it, didn't want it there. A lot of people actually want it because it gives us [funds for] our rec center. It was good hearing everyone's opinion, and making it more like finding out facts instead of just a general statement in the beginning, like, 'We don't want it, we're going to fight it.' So it was good that we were open … cuz a lot of us were kind of biased in the beginning. – Landfill Project participant
Recognizing that others' priorities differ from one's own	It can be frustrating having to work with this person and that person and you realize the layers that you have to work through. You realize that someone doesn't install solar panels just because they're lazy, but because they're a single mother and have other priorities. Like when I started my project, I wanted to put in a garden NOW but you have to work with people ... – Sustainability Initiatives participant
Developing a vision and planning to reach it	Like what exactly do you want this roof garden to be? Like okay yeah it's going to be part of the environment but how do you want it to feel? When people come and see your roof garden do you want it to be a place where people just relax? A place where it can be a learning center? A place where you know books or a lounge? Have a set plan and then do all the stuff that needs to come after that. – Roof Garden participant
Considering alternative options	Like before we made any move we were in the classroom for a good couple weeks trying to decide the best possible solution and trouble shooting any issues that we thought might arise and we were just constantly like rethinking everything. Trying to figure out every angle before making a set decision just to make sure that nothing, no corner was left untouched. – Roof Garden participant

Being persistent and staying motivated when obstacles arise	… the real thing to be successful is like to try to do your best, be motivated and all of that because if you don't really have that then it's like you're just going to give up on one little thing that, one little obstacle, one little bad thing that gets in your way, you're just going to give up and if you keep getting motivated and keep trying … you're going to succeed in what you have to do. – TRUCE participant
Learning how existing power structures work	I spent a lot of time going to the right people and asking for things and they would send me to someone else and then I'd be sent back to the first person who could help me after they were told by somebody else to do so. I spent a lot of time on administrative and feasibility ... I learned about how something might actually get done in bureaucracy ... and how to have a vision and stick with it. – Sustainability Initiatives participant

Science and Civic Learning: The Overlap

The above evidence suggests that participating in environmental action contributed in various ways to young people's science and civic learning. Here I consider parallels in young people's descriptions of their scientific and civic experiences and evidence of critical or "good" thinking in the context of their participation in environmental action.

Youth often described similar challenges, whether in the process of doing science or engaging in community action. For example, some found challenging defining a research question while others found challenging deciding on an action project. Some found challenging designing and conducting experiments in terms of planning ahead and figuring out how to make it work. Others found challenging developing a "big picture" vision and then planning and coordinating with peers to make it happen. Some spoke of debating with classmates about the interpretation of data, while others spoke

of sharing opinions in the discussion of topics related to personal and community interests. Some exhibited understanding of scientific relationships in a social-ecological system (e.g., relationships among green space, air quality, and asthma in an urban neighborhood), while others exhibited understanding of the power relationships in a social system (e.g., a school district).

Youth also exhibited critical thinking in their descriptions of their environmental action experiences, which reflected both scientific and civic dimensions. A few examples illustrate:

This youth recognized the public value of her work in articulating connections between nutrition, food security, environment, and health. She demonstrated preciseness in understanding the meaning of "organic" and "good" thinking in explaining this so that the interviewer understood correctly.

Youth: [Our work in the gardens and farmers market] basically goes around … to many people … because we help people with their obesity, sometimes they have high cholesterol, and sometimes when they go to the grocery store, they pay a lot for fruits and vegetables which have a high amount of pesticide in them.

Interviewer: So everything you grow here is organic?

Youth: Well, we're not certified organic, we don't put nothing on it, but we're not certified organic because they haven't come and checked or nothing like that.

Several youth, like this one, when asked what they disliked about their experience spoke of barriers to the success of their projects. Here, this youth exhibited "good" thinking in his understanding of the implications of relying on grant funding for the long-term sustainability of the project.

Interviewer: What's something that you have not liked about your experience [in the program]? Something that you would change?

Youth: We don't get like an annual budget like, 'Alright the school gives us $10,000 every year.' It's not like that. We had to write grants and stuff. So like everything is dependent on the budget, so if for a year we don't have any budget, all the plants … might die because we can't afford like the tools or like fertilizers and stuff. And that's one thing that I really don't like is this messes up like the project.

With conviction that their work was worthwhile, the comments of these two youth also demonstrated "good" thinking in questioning and wanting to understand better the magnitude and nature of that impact.

Youth A: I think also the events we have sort of let people know that you don't have to do really big things to make a difference. Like just by having a program, we're probably making differences in kids lives I'm sure.

Youth B: … maybe asking people what they consider the magnitude of [the] impact to be. Like … you know thinking and considering how many people we've actually helped. You know is it two or three people that we've really strongly impacted? Or maybe it's a dozen people we've you know changed the lives of. So making people think about that could be interesting.

Discussion

The multiple environmental action programs considered in this study demonstrate that the examples of successful integration of science education and community action documented by others (Fusco and Barton 2001, Roth and Lee 2004) are not isolated cases. This study showed science education and youth civic engagement occurring concurrently in multiple, diverse environmental action programs. Furthermore, it suggests that participation in environmental action can develop learners' capabilities in the "practical inquiry" of problem solving in everyday life and can influence young people's perceptions of themselves from passive to active citizens.

Youth in all but one program articulated connections between environmental action and science. Youth engaged in environmental action through science classes felt that it made science more relevant and meaningful. Others engaged in action through community organizations spoke knowledgeably about environmental (e.g., soil and plant science) and social systems (e.g., community supported agriculture). At most sites, young people's scientific understanding took the form of practical knowledge about

the environmental and social systems within which their action took place. Science occurred in context of broader social purposes (Jenkins 1994) (e.g., conducting experiments to understand roof gardens as a sustainability strategy in urban environments or learning about plants and soils in the course of community gardening) and youth participated in the social negotiations that produced knowledge relevant to those purposes (Roth and Désautels 2004).

Youth in all programs spoke positively about contributing to their community, and some youth described a shift from viewing themselves as passive recipients to active producers. In a review on citizenship development, Sherrod and colleagues (Sherrod et al. 2002) found that youth commonly define citizenship as simply doing what one is expected to do and obeying laws. To the contrary, this research found that the experience of participating in environmental action influenced some youths' ideas about themselves as community members from a passive concept of "staying out of trouble" to an active concept of producing, contributing, and doing something good for their community. Youth reported this transformation in rural, suburban, and inner-city communities. Youth also described developing a variety of civic dispositions and skills, such as considering diverse viewpoints and learning to work with others.

Others have argued for science that serves social purposes (Jenkins 1994, Roth and Désautels 2004), democratic deliberations that draw on multiple forms of knowledge (e.g., local/practical and scientific) (Stern and Fineberg 1996, Scott 1998, Fischer 2000), and science education in which youth participate in the social negotiations that produce knowledge (Fusco and Barton 2001, Roth and Lee 2004). This research further suggests that environmental action involves a civic-science synergy because it concurrently

engages youth in civic and scientific processes through which they have opportunity to develop the critical dispositions and skills characteristic of both scientific and civic endeavors (Figure 5.3).

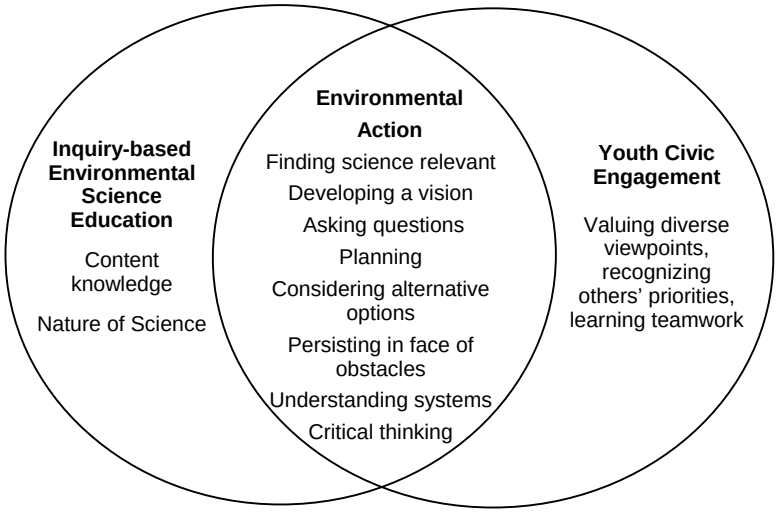

Figure 5.3. Scientific and civic dispositions, knowledge, and skills evident in youths' descriptions of their environmental action experiences. The interplay of science education and youth civic engagement occurs in the development of dispositions and process skills characteristic of both.

While the descriptions and reflections of youth participating in these ten programs suggest that environmental action can be a powerful experience for some youth, this is not the case for all participants. Environmental action can be an especially conducive context for the integration of science education and civic engagement but is not a panacea for developing politically and scientifically literate citizens. In addition, the facilitation of environmental action programs that integrate science and civic engagement involves challenges, including structuring young people's participation, managing time and project activities, feeling comfortable with uncertainty and chaos as a project evolves, and securing resources to support programs over the long-term (Schusler,

unpublished data). The practitioners facilitating these programs shared a willingness to take risks, and their narratives illustrated dedication, resourcefulness, flexibility, skills in project management and organization, comfort with chaos, and faith in young people's capabilities.

This study provides exploratory insights into the interplay of science education and youth civic engagement that warrants further research into the synergies and contradictions involved. In addition to investigating the scientific and civic dimensions of young people's environmental action experiences in greater depth, research should address the relationship of different pedagogical approaches to science and civic learning. For example, Westheimer and Kahne (2004) found that participatory and justice-oriented approaches to civic education, while both successful, contributed to distinct learning outcomes. Programs emphasizing participation did not necessarily develop students' abilities to critique root causes of social problems and vice versa (Westheimer and Kahne 2004).

Also of interest are the "dilemmas" (technical, political, cultural) of educational practice (Anderson 2002) involving inquiry and community action. For instance, Trautmann and MaKinster (2005) described how teacher/scientist partnerships enabled teachers to overcome dilemmas experienced around "launching into the unknown" in open-ended inquiry with their students. In addition, research exploring the integration of science and action from different cultural lenses, especially in non-Western societies, would challenge the Western assumptions of this theoretical framework and shed light on the potential for its adaptation elsewhere. Finally, if we believe that environmental action is a valuable context for developing young people's political and scientific literacy, and thereby developing their capacity to

participate in contemporary public life, then research should inquire why more teachers and non-formal educators do not approach environmental, science, or civic education through such an integrative framework.

CHAPTER 6

CONCLUSION

This research explored how practitioners facilitating youth participation in local environmental action in the U.S. understand and experience that work. It also inquired about the meaning that young people derive from their participation in environmental action. Forester (1999) described how the tensions within practice can lead to fresh lines of theoretical inquiry and insightful theorizing can provide suggestive avenues for future practice. In that spirit, I discuss the contributions and implications of this research for theory, methods, practice, and policy.

Research Contributions and Implications

Theory

Although EE research focuses predominantly on education as a means to influence individual environmental behaviors, practitioners in this inquiry expressed much richer, multi-faceted, holistic purposes motivating their practice. They valued young people's tangible contributions to positive environmental and community change but cared more about youths' development. In other words, youth development goals (e.g., raise a generation of literate youth) superseded environmental goals (e.g., revitalize the waterfront). Practitioners sought to develop youth as citizens and change agents. The interpretations developed through this research enhance understanding of youth environmental action as a pathway for developing citizens in participatory democracy.

This research also contributes to theoretical understanding of youth participation involving shared decision-making because it describes the experiences and roles of adults, which are largely missing from popular and scholarly literature. This research documented that adults played substantial roles even in environmental action with high levels of youth ownership and decision-making influence. Practice accounts suggested that a more apt theoretical construct is that of a youth-adult partnership. Central to practitioners' experiences of shared decision-making with youth was a tension between youth autonomy and practitioner authority, which I conceptualized as a duality that recognizes the dynamic interplay of seemingly conflicting elements. The autonomy-authority duality offers a theoretical framework for reflective practice as well as future research into poorly understood dimensions of youth-adult partnerships, such as power, communication, and transparency.

This research also offers a theoretical contribution in its application of youth development theory to environmental education contexts. It documented striking parallels between the youth development literature, young people's descriptions of their environmental action experiences, and practitioners' accounts. The conclusion is that environmental action is a valuable context for youth development. Viewing environmental action through a positive youth development framework offers guidance for practice and a broader theoretical lens for research.

Finally, this research builds on theory around science education and the role of science in society by conceptualizing environmental action as the intersection of inquiry-based science education and youth civic engagement. This research suggests that through environmental action youth can develop

both scientific and civic dispositions, knowledge, and skills. While inquiry-based science education and youth civic engagement are distinct phenomena, the processes of scientific inquiry and civic participation involve many of the same dispositions and skills. Primary among these are thinking critically about social-ecological systems and participating in the social negotiations that produce knowledge. Thus, environmental action offers opportunity for the synergistic integration of science and civic learning.

Methods

Scholars are recognizing narrative as a useful approach that complements other methodologies in the field of natural resources, especially for human dimensions research focused on understanding human intention and action in the realm of natural resource management (e.g., Fairhead and Leach 1995, Jones 1999, McComas and Shanahan 1999, Mehta 2001). In this study, I used narrative as a tool to collect rich data grounded in descriptions of actual experience and thereby reduce validity threats that can arise in interviews (see Chapter 1). This use of practice narratives, while not breaking new ground, nonetheless contributes to a growing body of literature reflecting diverse approaches to the use of narrative in social science research around environmental and natural resources management.

Practice

The practice of engaging youth in environmental action is complex and multi-faceted. Practitioners described it as messy, chaotic, and challenging but at the same time exciting, rewarding, and invigorating. The conceptual frameworks developed through this research offer innovative insights for

practice. Conceptualizing youth participation in environmental action as a partnership gives recognition to the valuable roles that both youth and adults play in these endeavors. Practice accounts suggested that partnering with youth involves valuing reciprocal learning and young people's assets and contributions; recognizing one's own assets and responsibilities as an elder; being aware of power imbalances and acting to lessen them; following young people's lead even sometimes when youth go in a direction counter to one's own preferred route; being transparent in communicating one's own opinions and views; and ultimately being responsible and using wise judgment in exercising one's authority when needed. This research demonstrates that passionate, dedicated adults who are intentional in their interactions with youth can build strong youth-adult partnerships that contribute to environmental and community change.

Adults interested in increasing youth participation in environmental and other community issues can anticipate that they will experience the autonomy-authority duality. Practitioners described various dimensions of this duality, such as "balancing" youth freedom with adult-provided structure, stepping back to let youth lead and stepping in to keep a project on track, integrating youth interests with curriculum or organizational goals, managing power dynamics, and communicating openly and transparently. Some experienced this duality as a challenge, while others viewed the ability to share control as an essential skill for success in participatory practice. Through a variety of strategies practitioners structured opportunities for youth decision-making and supported youth in meeting challenges associated with increased autonomy.

Practitioners provided rich accounts of environmental action as a developmental context. The practice themes that emerged in this study were

consistent with existing understanding of settings that promote positive youth development. In addition to sharing decision-making power, these themes included: creating safe spaces; providing structure; building respectful, trusting relationships; bridging differences and creating opportunities for all learners to contribute; setting clear, rigorous expectations; providing opportunities for meaningful contribution; supporting youth as they encounter new challenges; connecting youth with their community; and expanding horizons through novel experiences.

During interviews many practitioners expressed interest in learning what has and has not worked in others' experiences. For example, how have others handled conflict resolution with youth, or with other adults involved in a program? How have others structured their programs? Where have others found resources? How have others garnered community support? How have others tailored projects to the interests and talents of all participants? What have been others' long-term goals? How have others prioritized those goals? What has the process looked like, step-by-step or day-by-day? How have others defined success? What have been their successes? What have been their challenges? How have others assessed impacts on individuals and communities, especially those that are less tangible or long-term? What conceptual or theoretical frameworks have guided others in their practice? Many of these questions will be addressed further in the outreach component of this research project, which will include profiles or vignettes drawn from practitioner interviews to illustrate both the "nuts and bolts" of practice and provide insight into practical theories.

Policy

This research raises several policy-related questions around how to support and sustain practitioners and programs that meaningfully involve young people in environmental and community action. A primary concern on the minds of practitioners was the sustainability of their work. A youth program manager's words reflected the sentiments of many: "… the resources. To do things like this, you're always barking, you're always looking, you're always piece mealing … It needs to be a line item in the budget. It needs to be sustainable. It needs to be valued. So, how are you going to do this?" This research suggests the value of future inquiry investigating why and how funders, school and program administrators, school and organizational governance boards, and local, state, and national policy makers do or do not support (e.g., through funding, training, institutional climates that encourage risk-taking, creativity, and innovation) youth-adult partnerships creating positive environmental change.

A related question on some practitioners' minds was how to raise the profile of this work, especially in fields such as natural resource management or urban planning that view youth participation as a "sideshow" to the real work of the field. How might planners and natural resource managers meaningfully engage youth when appropriate in community decision-making around environmental management? Among teachers, some wondered why more teachers are not moving in such "creative directions"? What are the barriers? How can the development of democratic citizens in the context of environmental and community sustainability evolve from youth action projects extending into the community into intergenerational, community initiatives?

Future Inquiry

This research suggests several avenues for further inquiry. Practitioners described environmental action contributing to multiple impacts at individual and community levels. Little is understood about how this occurs. How do young people's actions contribute to community impacts? How does contributing to community impacts through environmental action develop young people's competence as citizens? Further research should assess individual and community level impacts and explore the feedback loops created when environmental education programs draw from and contribute to community assets.

The autonomy-authority duality provides a conceptual framework for further research exploring not only how practitioners but also youth experience this tension and the creative processes and products of shared decision-making that emerge in the "space between" its seemingly separate yet interdependent elements. Furthermore, how does the autonomy-authority duality, which seems not unique to working with youth but inherent in participatory processes, play out in other natural resource management situations?

Research that further investigates how youth develop through participation in environmental action would contribute to the environmental education field, where little research has addressed developmental pathways, and to the youth development field, where little research has investigated organized youth activities involving the environment. Furthermore, much remains to be learned around various dimensions of youth-adult partnerships, such as communication and power, from both youth and adult perspectives.

This study provided exploratory insights into the interplay of science

education and youth civic engagement that warrants further research into the synergies and contradictions involved. In addition to investigating the scientific and civic dimensions of young people's environmental action experiences in greater depth, research should address the relationship of different pedagogical approaches to science and civic learning and the technical, political, and cultural "dilemmas" that arise in educational practice integrating scientific inquiry and community action. Finally, if we believe that environmental action is a valuable context for developing young people's political and scientific literacy, and thereby developing their capacity to participate in contemporary public life, then research should inquire why more teachers and non-formal educators do not approach environmental, science, or civic education through such an integrative framework.

APPENDIX A

PRACTITIONER INTERVIEW SAMPLE

The interview sample included practitioners working in diverse contexts, which I grouped by a primary programmatic focus on science education, youth development, or community development.

Interviewees included nine teachers engaging students in environmental action projects through middle and high school science classes. Most of these teachers also coordinated after-school or summer programs in the form of science or environmental clubs in addition to integrating community-based environmental projects with their classroom instruction. Their teaching experience ranged from five to over 30 years with most having taught for at least 10 years. Their educational backgrounds included bachelors, masters (nearly all) and one doctoral degree in sciences (e.g., biology, chemistry, earth science, ecology, engineering, geology, physics, medical technology) and social sciences and humanities (e.g., sociology, Russian, linguistics) in addition to education (e.g., advanced classroom teaching, child psychology, curriculum instruction, environmental education, reading, secondary education, science curriculum, science education). Two taught in rural communities, three in suburban school districts, three in urban areas, and one at a school in a small city. Interviewees also included two non-formal science educators, one at a science center and the other at an urban watershed education center. For both environmental action constituted a small portion of broader programming around science and watershed management, respectively.

Eight interviewees worked in programs where the main mission was positive youth development. Two worked in urban community-based organizations, one of which provided services to the incarcerated and their families; one worked in a rural, residential center for youth with emotional, behavioral, or life circumstance challenges; one worked with a children's garden; two worked for a 4-H youth development program operating in rural communities; and two worked with statewide Cooperative Extension programs that brought together teens from multiple communities. For four of these practitioners, the environment was just one area among many (e.g., arts, media, nutrition, fitness) that they incorporated into youth programs. Of the others, three worked with youth in gardening and horticulture programs, while one focused on the development of teen leadership skills through engagement in environmental policy. These practitioners ranged in experience from one just beginning her professional career to another having worked in her position as education program coordinator for 18 years. Their formal educational training ranged from associate to masters degrees, with most holding bachelors degrees, in fields including commercial crops, community development, community ecology, horticulture, human ecology, and psychology.

Fourteen interviewees worked in community development organizations, all located in urban areas. Several of these organizations' goals included youth development and empowerment within broader social change missions. Six of these practitioners focused on urban food systems. Each of the others focused on one or more of the following areas: community gardens, community forestry, environmental issues, environmental justice, the built environment, and youth participation in community change. Some of these

practitioners were recently out of college, while others had nearly thirty years of professional experience. A few in their early twenties would be considered youth themselves by some definitions and had often participated as teens in the programs for which they were now staff members. Formal educational training included bachelors and masters degrees (over half had or were working towards a masters) in disciplines including agriculture, business administration, education, English, forestry, psychology, public administration, religion, social work, sociology, and urban planning.

The programs and schools or organizations[9] employing practitioners interviewed were the following:

- Build San Francisco Institute, **Architectural Foundation of San Francisco**, San Francisco, CA
- Children's Garden Consultants, **Garden Based Learning Program**, **Department of Horticulture, Cornell University**, Ithaca, NY
- Creek Freaks, **Southeastern Natural Sciences Academy**, Augusta, GA
- Earth Force, **Academic Magnet High School**, Charleston, SC
- Earth Force, **Grant Community Middle School**, Salem, OR
- East New York Farms!, **United Community Centers**, Brooklyn, NY
- Ecology Action Initiatives, **Lehman Alternative Community School**, Ithaca, NY
- Environmental Issues Outreach Program, Science Club, **Cairo High School**, Cairo, GA
- Environmental Justice Organizing, **Youth Ministries for Peace and Justice**, Bronx, NY
- Garden Mosaics and related programs, **Ithaca Children's Garden,** Ithaca, NY

[9] One interviewee did not grant permission to identify the organization; thus, this list contains 27 of the 28 programs and organizations included in this study.

- Garden Mosaics and related programs, TRUCE Fitness and Nutrition Center, **Harlem Children's Zone,** New York, NY (Harlem)
- Growing Green, **Massachusetts Avenue Project**, Buffalo, NY
- Growing Up in New York City, **Growing Up in Cities**, New York, NY
- Horticulture Program, **Hillside Children's Center** Varick Campus, Varick, NY
- Junior Scientists Club, **Nauticus National Maritime Center**, Norfolk, VA
- Michigan 4-H Youth Conservation Council, **Michigan 4-H Foundation,** Tustin, MI
- Onondaga Earth Corps, Community Forestry, **Cornell Cooperative Extension of Onondaga County**, Syracuse, NY (South Side)
- Pine Bush Project, **Farnsworth Middle School**, Guilderland, NY
- Roof Garden Club, **School of the Future**, New York, NY (Manhattan)
- Rural Youth Services, **Cornell Cooperative Extension of Tompkins County**, Caroline and Lansing, NY
- Students Against Violating the Earth (SAVE), **Souderton Area High School**, Souderton, PA
- Summer Youth Program, Academic Year Program & Internships, **The Food Project**, Lincoln, MA
- Team Estonoa, **St. Paul High School**, St. Paul, VA
- Training Student Organizers, **Council on the Environment of New York City**, New York, NY
- Youth Envision Program, **Literacy for Environmental Justice**, San Francisco, CA (Bayview Hunt's Point)
- Youth Mural Project & Youth Environmental Fellowship Program, **Green Guerillas**, New York, NY
- Young Park Prairie Project, **Blue Springs South High School**, Blue Springs, MO

APPENDIX B

INTERVIEW GUIDES

Guide for Interviews with Practitioners

Developed by Tania Schusler based upon practitioner profile interview guide by Dr. Scott Peters.

Objectives

1. *Understand educators' motivation, philosophy or principles guiding his/her work.*
2. *Understand how educator articulates successes and challenges through telling of a "success story" about a specific action project with youth.*
3. *Gain insights into specific practices, tools and strategies used by educators to engage youth in local environmental action.*
4. *Gain insights into contextual forces that support or impede educators in this work.*

Part One: Educator Background and Program Description

I'd like to begin by learning more about yourself, as well as _____ program, its history, goals and activities. (Some of this information may be found in program documents and materials.)

1. What is your current position (including exact title) and how long have you been in this position? Can you give me a brief overview of the kinds of things you do in your work? What led you to this position? What were you doing before you came here? What is your educational background (including highest degree received) and/or training in this kind of work? Where are you originally from? How long have you lived and/or worked in this community?

2. When did you first become involved with _____ program? How did you become involved with it?

3. What is your specific role in _____ program? What do you do?

4. What would you say most motivates you to work with youth on environmental issues? What are you most excited or passionate about in this work?

5. How long has _____ program been existence? (Or, how long has your organization been involved with ____ program?) How did it get started? How has the program evolved over time?

6. What do you feel is the purpose of _____ program? What are your specific goals for working with youth in _____? How does the program relate to the mission/goals of your organization?

7. How many paid/professional staff are involved with the program? What are their roles? How many volunteers are involved? What are their roles?

8. Tell me more about the youth involved. How many are there? Of what ages? What are their demographic backgrounds? In what communities do they live? How do youth become involved in the program? How do you recruit and select participants?

9. Who decides what activities will be undertaken by the youth involved?

10. How are youth involved in environmental action?

11. What do you hope that youth learn through their participation in _____?

12. What do you think participants actually do learn? What can you point to as evidence of that learning? How do you assess this (observation, youth performance/accomplishments, evaluation, numbers, etc.)? How do you think that learning occurs?

13. In what ways are youth involved with science? How do youth learn about and/or do science? How does science education come into play in ____ program? How large a focus is science education?

14. In what ways do youth connect with the community? How are youth engaged with the community? How does community action come into play in ____ program? How large a focus is community action?

15. In what ways are youth involved as leaders? How does leadership come into play in ____ program? How large a focus is leadership development?

Part Two: Success Story – Practices, Contextual Forces

Tell me a specific success story from your program. (Educator will be asked ahead of time to identify a specific story to share. In educators' telling of story, probe for (a) how educator is defining success (i.e., what counts as success), (b) what specifically the educator did (i.e., practices), (c) contextual forces important to success, and (d) barriers or obstacles and how they were overcome.)

1. What's the specific success story you're going to sharing with me? Could you please give me a brief overview?

2. Tell me the story of this project. How did it start? How did you become involved with it? What did you do? Tell me more about your specific roles and contributions.

3. How were youth involved? What do you think motivated youth to become involved? Tell me more about their specific roles and contributions.

4. How do you think youth benefited from this experience? What do you think they learned? What can you point to that demonstrates this? How do you think that learning came about?

5. How was the community involved? Which specific community members or groups did you work with? Tell me more about their specific roles and contributions.

6. What changes do you believe occurred for the community because of this experience? What can you point to as evidence of this?

7. In what ways do you view this project as successful? What specifically was accomplished?

8. How was this success possible? What were key turning points in this project? What surprises occurred? What key relationships mattered most? What were the key sources of support that you encountered?

9. What was most difficult or challenging about this experience? What did you do to deal with these challenges? What were key sources of resistance that you encountered? Did the work fail in some ways? How?

10. What was most rewarding about this work?

11. What did you personally learn from this project?

12. What lessons would you offer to someone embarking on a project similar to this one?

13. What might you do differently – if you were to do this project over again, or if you were to tackle a similar project in the future?

14. How would you describe your role as an educator in this project? What analogies or metaphors might apply (e.g., teacher, coach, facilitator, guide, mentor, model)?

15. What skills did you need to do the work you just told me about? Where and how did you learn those skills? What does it take to be successful at this type of work with youth?

Wrap-up

1. If you were in my shoes doing research on programs like _____, what questions would you ask? What would you like to learn from the experiences of others doing similar work as yourself?

2. Anything more you would like to add?

Demographic

I'd like to ensure that my research includes educators with diverse backgrounds. To that end, I'd like to ask you a few quick demographic questions if you don't mind.

1. What age range do you fall within? (e.g., 20-29, 30-39, 40-49 … 70-79, etc.)
2. What is your ethnic background?
3. What is your gender?
4. What town/city/neighborhood do you live in?

Guide for Focus Groups with Youth

Developed by Tania Schusler with some questions drawn from a youth interview guide shared by Nancy Schaff from her "Civic Development in 4-H Study."

Objectives

1) *Understand the experiences of youth participating in local environmental action, including its meaning and significance to them.*
    a) *Elicit youth descriptions of their activities*
    b) *Elicit youth descriptions of what these activities have meant to them and what they have learned*
2) *Explore youth perceptions of science, community/civic engagement, and leadership in the context of their participation in local environmental action.*

Part One: Introductions

Please go around the circle and introduce yourself. Please tell us:
- how you became involved in _____ program,
- how long you have been involved,
- what you think is the best thing or what excites you most about _____ program, and
- something you don't like about it.

Part Two: Reflections on Program Experiences

*Telling the **story** of participation in local environmental action:*

1. *Focusing on a specific action project,* Tell me the story of _____. How did you begin? Who was involved? What happened? Who did what? What was a key turning point? What surprises happened? What was critical to your success? What barriers did you face? How did you deal with them? What will you do next? What kind of impact do you think you have had on the community? What can you point to that shows this impact?

2. What has your experience in _____ program been like? Has it been fun, tough, exciting, confusing? Would you give me an example? Tell me more.

3. What is the most important thing that you've learned as a part of _____? How did you learn that?

Other questions to probe for reflections on this experience:

4. What other skills, capacities, or lessons have you learned? How did you learn these?

5. What connection do you see between _____ program and science? Have you ever taken a science class or studied the scientific process? What connections do you see? How has your experience in _____ differed from other experiences with science? How have your ideas about science changed over the time you've been a part of _____?

6. Over the time you've been a part of _____, how have your ideas changed about what it means to be a good community member? How do you see yourself as a part of your community?

7. Over the time you've been a part of _____, how have your ideas changed about what it means to be a leader? How do you see yourself as a leader? Would you give me an example? Tell me more. (*Or …*What qualities do you think are important to be a good leader? How have you developed some of these qualities during _____ program?)

8. If you were in __[name of educator(s)]__'s position, what would you do to involve young people in projects like _____? What recommendations would you offer for adults working with teens/kids to improve their environment?

Wrapping up:

9. What other questions do you think are important for me as a researcher to ask teens/kids that are a part of programs like _____?

10. What more would you like to add? Is there anything I haven't asked about that you feel is important to share?

APPENDIX C

LETTER OF INTRODUCTION

DATE

Dear _____:

I am a Ph.D. candidate in the Department of Natural Resources at Cornell University. I am writing to inquire if I could interview you for a research project investigating *how* teachers, community organization staff, and extension educators are working with youth to create positive environmental change in their communities. I learned of your work through _____. I'd like to invite you to participate in this research as one of a few dozen individuals identified across the country who are successfully engaging young people in environmental action. The enclosed "fact sheet" tells you more about this research.

The interview would be conducted [by phone or in person] and consists of two parts. The first part covers general background about yourself, your [organization or school], and your [program or class]. The second part focuses on the telling of a "success story" detailing a specific action project conducted by youth [reference identified project here if appropriate]. In all, the interview requires about two hours of time and can be conducted in one or two sittings depending on your availability. If you are based in New York State, I would also like to conduct a 30-40 minute focus group with youth participating in your program to learn more about their experiences.

Little research has addressed the practice of adults who are successfully fostering youth participation in environmental and community issues. I hope to have the opportunity to learn from your experience.

I will call you in the near future to learn of your interest in and availability for an interview. In the meantime, please do not hesitate to contact me at 607-279-1115 or tms23@cornell.edu if you have questions.

Thank you for your consideration.

Sincerely,

Tania M. Schusler
Ph.D. Candidate, Cornell University
Environmental Issues Educator, Cornell Cooperative Extension of Tompkins County

EDUCATOR PRACTICE ENGAGING YOUTH IN LOCAL ENVIRONMENTAL ACTION

PURPOSE

This research has been designed to learn from the experiences of individuals who are successfully working with youth to create positive environmental change in their communities. Tania Schusler, a doctoral candidate at Cornell University and educator with Cornell Cooperative Extension of Tompkins County, is conducting in-depth, open-ended interviews with staff of community-based organizations, extension educators and teachers from around the country in order to gain understanding of:

- educators' motivations and philosophies or principles guiding their work with youth;
- how educators describe successes and challenges;
- specific practices, tools and strategies that educators find effective in engaging youth; and
- contextual forces, such as institutional support or funding, that educators believe support or impede them in this work.

The goal of this research is to develop a more holistic understanding of educator practice, identify best practices, and share them with others interested in creating opportunities for young people to engage in environmental issues in their communities.

FUNDING

This research is part of a project titled "Developing Youth Leadership in Local Environmental Action" that is supported by the Cornell University Agricultural Experiment Station federal formula funds, Project No. NYC-147459, received from Cooperative State Research, Education and Extension Service, U.S. Department of Agriculture.

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APPENDIX D

CONSENT FORMS

Developing Youth Leadership in Local Environmental Action

Educator Consent Form

You are invited to participate in a research study about youth participation in community-based environmental action. You were selected as a possible participant because of your role in [e.g., Garden Mosaics]. We ask that you read this form and ask questions before agreeing to be in the study.

Background Information: The purpose of this study is to learn from the experiences of individuals who are successfully working with youth to create positive environmental change in their communities. We are conducting in-depth, open-ended interviews with staff of community-based organizations, extension educators and teachers from around the country in order to gain understanding of:

- educators' motivations and philosophies or principles guiding their work with youth;
- how educators describe successes and challenges;
- specific practices, tools and strategies that educators find effective in engaging youth; and
- contextual forces, such as institutional support or funding, that educators believe support or impede them in this work.

The goal of this research is to develop a more holistic understanding of educator practice, identify best practices, and share them with others interested in creating opportunities for young people to engage in environmental issues in their communities.

Procedures: If you agree to be in this study, we will ask you to participate in a one-on-one oral interview up to 2 hours in length and share materials that can help us learn more about your program. With your consent, we would like to tape record the interview so as not to lose the details of our conversation.

If you are based in New York State, we also will ask you to help coordinate a 30-40 minute group interview with youth involved in your program. We are especially interested in what young people believe they have learned through the experience of creating positive environmental change in their community.

Risks and Benefits: We do not anticipate any risks for you participating in this study, other than those encountered in day-to-day life. Benefits of participating in this study include the opportunity to reflect on your work, including your successes and challenges, and to inform the practice of others wanting to increase youth participation in their programming around environmental and community issues.

Voluntary Nature of Participation: Your decision whether or not to participate will not affect your current or future relations with the program and/or organization of which you are currently affiliated, nor with Cornell University. If you decide to participate, you are free to withdraw at any time without affecting those relationships.

Confidentiality: We would like to acknowledge you in reports, publications, or public presentations that result from this study. With your permission, we would like to identify you and your program/organization in publications and presentations based on this research. If you do not want us to identify you or your program/organization, you may still participate in this study and we will make every effort to conceal your identity in publications and presentations. You may request at any point during the project that your identity be concealed in reports from this study. At your request, we will provide you with the opportunity to review and provide feedback on written materials from this study before they are submitted for publication.

Contacts and Questions: The main researcher conducting this study is Tania Schusler of Cornell University. You may reach her at (607) 272-2292 or tms23@cornell.edu. Please feel free to ask any questions you have now or in the future. If you have any questions or concerns regarding your rights as a participant in this study, you may contact the Cornell University Committee on Human Subjects (UCHS) at (607) 255-5138, or access their website on the Internet at http://www.osp.cornell.edu/Compliance/UCHS/homepageUCHS.htm.

Statement of Consent: I have read the above information, and have received answers to any questions I asked. I consent to participate in the study.

Signature _____ Date _____

Permission for audio recording:

May we audio record our interview with you?

____ Yes ____ No

Permission to Identify Individual:

May we identify you in publications and presentations about this research?

____ Yes ____ No

Permission to Identify Program and Organization:

May we identify your program and organization in publications and presentations about this research? ____ Yes ____ No

This consent form was approved by the UCHS on [date].

Developing Youth Leadership in Local Environmental Action

Parental Consent and Youth Assent Form

Because your child is involved in [e.g., Garden Mosaics], your child is invited to be in a study about youth participation in community-based environmental action. We ask that you and your child read this form and ask questions before agreeing to participate in this study.

The study: The purpose of this study is to learn how youth get involved with environmental issues in their communities. If you agree to allow your child to participate, and your child would like to do so, he or she will be asked to respond to a half dozen questions in a group interview with other children in [e.g., Garden Mosaics]. We will ask questions about the young people's experiences in [e.g., Garden Mosaics], such as how they became involved, what activities they do, what they like and don't like, and what they have learned through the program. There are no right or wrong answers. We simply would like to know what participants think about their experiences with [e.g., Garden Mosaics]. They can ask us questions about this study at any time. If they decide that they no longer want to speak with us, they can stop at any time.

We would like to audio record the group interview so as not to lose details of the conversation.

Risks and benefits: There are no risks associated with this study aside from those encountered in day-to-day life. The main benefit is the opportunity for young people to voice their thoughts and opinions about [e.g., Garden Mosaics], which can be an empowering experience.

Confidentiality: The records of this study will be kept private. In reports from this study, we will not include any information that would make it possible for someone to identify your child.

Voluntary nature of participation: Your decision whether or not to allow your child to participate will not affect your current or future relations with [e.g., Garden Mosaics].

Contacts and Questions: The main researcher conducting this study is Tania Schusler from Cornell University. You may reach her at (607) 272-2292 or tms23@cornell.edu. Please feel free to ask any questions now or any time in the future. In addition, if you have any questions or concerns about your child's rights as a participant in this study, you may contact the Cornell University Committee on Human Subjects (UCHS) at (607) 255-5138, or you may access their website on the Internet at http://www.osp.cornell.edu/Compliance/UCHS/homepageUCHS.htm.

Permission to participate in this study, including audio recording of the group interview:

Child's name: _____ Child's age: _____

Signature of child: _____

Signature of Parent _____ Date _____

This consent form was approved by the UCHS on [date].

Desarrollando el Liderazgo Juvenil en Acción Ambiental Local

Formulario de Consentimiento para Padres y Jóvenes

Debido a que su hijo/a está participando en [Jardín Mosaicos], lo/a hemos invitado a formar parte de un estudio sobre la participación juvenil en acciones ambientales a nivel comunitario. Le pedimos que lea este formulario con su hijo/a y nos haga preguntas antes de darnos su aprobación para participar en este estudio.

El estudio: El propósito de este estudio es aprender cómo los jóvenes se comprometen con asuntos de medio ambiente en sus comunidades. Si usted acepta que su hijo/a participe y su hijo/a quiere participar, el/ella tendrá que responder a media docena preguntas que se harán en una entrevista a su grupo junto con otros chicos/as en [Jardín Mosaicos]. Se le pedirá a los jóvenes que hablen sobre sus experiencias en el programa, incluyendo qué actividades han hecho, qué les gusta o les disgusta y qué han aprendido. No hay repuestas correctas o incorrectas, solamente nos gustaría saber qué piensan los jóvenes de sus experiencias en [Jardín Mosaicos]. Los jóvenes pueden preguntarnos más sobre este estudio en el momento que deseen. Si deciden que ya no quieren hablar más con nosotros, pueden terminar su participación en cualquier momento.

Nos gustaría grabar la entrevista del grupo para no perder los detalles de la discusión.

Riesgos y beneficios: No existen riesgos asociados con este estudio, excepto aquellos que existen en el día a día de la vida de cada persona. Para los jóvenes, el beneficio principal es la oportunidad de expresar o exponer pensamientos y opiniones relacionadas con [e.g., Jardín Mosaicos], lo cual puede ser una experiencia de mucho valor.

Confidencialidad: Los registros de este estudio se mantendrán de manera privada. Nos comprometemos a que bajo ninguna circunstancia se incluya información alguna que haga posible identificar a su hijo/a en este estudio.

Participación voluntaria: La decisión de permitirle o no a su hijo/a que participe en este estudio no afecta para nada la relación presente o futura con el [Jardín Mosaicos].

Contactos y preguntas: La investigadora que conduce este estudio es Tania Schusler de la Universidad de Cornell. Puede comunicarse con ella al teléfono (607) 272-2292 o por correo electrónico tms23@cornell.edu. Por favor siéntase con la libertad de hacer cualquier pregunta ahora o en el futuro. Si tiene alguna preguntas o le preocupan los derechos de su hijo/a como participante en este estudio, puede ponerse en contacto con el Comité de Asuntos Humanos de la Universidad de Cornell (UCHS**)** al teléfono (607) 255-5138, o a través de su página de Internet http://www.osp.cornell.edu/Compliance/UCHS/homepageUCHS.htm.

Permiso participar en este estudio, incluyendo grabaciones de audio de la entrevista en grupo:

Nombre de su hijo/a: _____ Edad de su hijo/a: _____

Firma de su hijo/a: _____

Firma del padre o madre:_____ Fecha _____

Este formulario de consentimiento fue aprobado por UCHS [fecha].

BIBLIOGRAPHY

Adams, E., and S. Ingham. 1998. Changing Places: Children's Participation in Environmental Planning. The Children's Society, London.

Anderson, R. D. 2002. Reforming science teaching: what research says about inquiry. Journal of Science Teacher Education **13**:1-12.

Apple, M. W. and J. A. Beane, editors. 2007. Democratic Schools: Lessons in Powerful Education, 2nd Edition. Heinemann, Portsmouth, NH.

Argyris, C., and D. A. Schön. 1974. Theory in Practice: Increasing Professional Effectiveness. Jossey-Bass, Inc., San Francisco, CA.

Baek, E., and S. A. Barab. 2005. A study of dynamic design dualities in a web-supported community of practice for teachers. Educational Technology and Society **8**:161-177.

Bailin, S. 2002. Critical thinking and science education. Science & Education **11**:361-375.

Balsano, A. B. 2005. Youth civic engagement in the United States: understanding and addressing the impact of social impediments on positive youth and community development. Applied Developmental Science **9**:188-201.

Barab, S. A., J. G. MaKinster, and R. Scheckler. 2003. Designing system dualities: characterizing an online professional development community. Information Society **19**:237-256.

Battistoni, R. M. 2002. Civic Engagement across the Curriculum: a Resource Book for Service-learning Faculty in all Disciplines. Campus Compact, Providence, Rhode Island.

Benson, P. L., and R. N. Saito. 2000. The scientific foundations of youth development. Pages 125-148 *in* Youth Development: Issues, Challenges and Directions. Public/Private Ventures, Philadelphia, PA.

Bishop, K., and W. Scott. 1998. Deconstructing action competence: developing a case for a more scientifically-attentive environmental education. Public Understanding of Science **7**:225-236.

Cahill, C., and R. A. Hart. 2006. Pushing the boundaries: critical international perspectives on child and youth participation - series introduction. Children, Youth and Environments **16**:I-III.

Camino, L. 2005. Pitfalls and promising practices of youth-adult partnerships: an evaluator's reflections. Journal of Community Psychology **33**:75-85.

Camino, L., and S. Zeldin. 2002. From periphery to center: pathways for youth civic engagement in the day-to-day life of communities. Applied Developmental Science **6**:213-220.

Camino, L. A. 2000. Youth-adult partnerships: entering new territory in community work and research. Applied Developmental Science **4**:11-20.

Cervone, B., and K. Cushman. 2002. Moving youth participation into the classroom: students as allies. New Directions for Youth Development **96**:83-99.

Chase, S. E. 1995. Ambiguous Empowerment: The Work Narratives of Women School Superintendents. University of Masschusetts Press, Amherst, MA.

Chawla, L. 2002. Growing Up in an Urbanising World. UNESCO and Earthscan Publications, London, UK.

Chawla, L. 2007. Participation and the ecology of environmental awareness and action. *in* A. Reid, B. B. Jensen, J. Nikel, and V. Simovska, editors. Participation and Learning: Perspectives on Education and the Environment, Health and Sustainability. Springer, Dordrecht.

Chawla, L., and H. Heft. 2002. Children's competence and the ecology of communities: a functional approach to the evaluation of participation. Journal of Environmental Psychology **22**:201-216.

Clark, A., and B. Percy-Smith. 2006. Beyond consultation: participatory practices in everday spaces. Children, Youth and Environments **16**:1-9.

Colquhoun, D. 2000. Action competence, social capital and the health promoting school. Pages 93-106 *in* B. B. Jensen, K. Schnack, and V. Simovska, editors. Critical Environmental and Health Education: Research Issues and Challenges. Danish University of Education, Copenhagen.

Creswell, J. W. 1998. Qualitative Inquiry and Research Design: Choosing Among Five Traditions. Sage Publications, Thousand Oaks, CA.

CSIP. 2006. Cornell Science Inquiry Partnerships. Cornell University, Ithaca, NY. Retrieved from the World Wide Web March 23, 2007: http://csip.cornell.edu/.

Csobod, E. 2000. Conditions for developing democracy, action competence and environmental education in a country under transition - experiences from Hungary. Pages 209-217 *in* B. B. Jensen, K. Schnack, and V. Simovska, editors. Critical Environmental and Health Education: Research Issues and Challenges. Danish University of Education, Copenhagen.

de Winter, M. 1997. Children as Fellow Citizens. Radcliffe Medical Press, Oxford, UK and New York.

Deshler, D., and N. Grudens-Schuck. 2000. The politics of knowledge construction. Pages 592-611 *in* A. L. Wilson and E. R. Hayes, editors. Handbook of Adult and Continuing Education. Jossey-Bass, Inc., San Franciso, CA.

Dewey, J. 1938. Experience and Education. Collier Macmillan Publishers, New York and London.

Disinger, J. F. 2001. K-12 education and the environment: perspectives, expectations, and practice. Journal of Environmental Education **33**:4-11.

Dodge, J., S. M. Ospina, and E. G. Foldy. 2005. Integrating rigor and relevance in public administration scholarship: the contribution of narrative inquiry. Public Administration Review **65**:286-300.

Driskell, D. 2002. Creating Better Cities with Children and Youth: A Manual for Participation. UNESCO and Earthscan Publications, London, UK.

Dryzek, J. S. 1997. The Politics of the Earth: Environmental Discourses. Oxford University Press, Cambridge, UK.

Dworkin, J. B., R. Larson, and D. Hansen. 2003. Adolescents' accounts of growth experiences in youth activities. Journal of Youth and Adolescence **32**:17-26.

Eames-Sheavly, M. L. 1999. Children and the Environmental Aspects of Community Development. Masters Thesis. Cornell University, Ithaca, NY.

Eccles, J., and J. A. Gootman, Editors. 2002. Community Programs to Promote Youth Development. National Academy Press, Washington, D.C.

Emmons, K. M. 1997. Perspectives on environmental action: reflection and revision through practical experience. Journal of Environmental Education **29**:34-44.

Fairhead, J., and M. Leach. 1995. False forest history, complicit social analysis: rethinking some West African environmental narratives. World Development **23**:1023-1035.

Fien, J. 1993. Education for the Environment: Critical Curriculum Theorising and Environmental Education. Deakin University Press, Victoria, Australia.

Fien, J., and P. Skoien. 2002. "I'm learning how you go about stirring things up - in a consultative manner": social capital and action competence in two community catchment groups. Local Environment **7**:269-282.

Figueroa Jr., R. 2003. TRUCE Carrie McCracken Community Garden Action Project. Garden Mosaics. Retrieved from the World Wide Web November 11, 2006: http://www.gardenmosaics.cornell.edu/pgs/data/actionread.aspx?garden=107.

Fischer, F. 2000. Citizens, Experts, and the Environment: The Politics of Local Knowledge. Duke University Press, Durham, NC.

Forester, J. 1999. The Deliberate Practitioner. MIT Press, Cambridge, MA.

Freire, P. 1973. Education for Critical Consciousness. Continuum, New York, NY.

Fusco, D., and A. Barton. 2001. Creating relevant science through urban planning and gardening. Journal of Research in Science Teaching **38**:860-877.

Gibson, C. 2001. From Inspiration to Participation: A Review of Perspectives on Youth Civic Engagement. The Grantmaker Forum on Community and National Service, Berkeley, CA.

Greenwood, D. J., and M. Levin. 1998. Introduction to Action Research: Social Research for Social Change. Sage Publications, Thousand Oaks, CA.

Halpern, R., G. Barker, and W. Mollard. 2000. Youth programs as alternative spaces to be: a study of neighborhood youth programs in Chicago's West Town. Youth and Society **31**:469-506.

Hanna, P. R. 1936. Youth Serves the Community. D. Appleton-Century Company, Inc., New York and London.

Hansen, D. M., R. Larson, and J. B. Dworkin. 2003. What adolescents learn in organized youth activities: a survey of self-reported developmental experiences. Journal of Research on Adolescence **13**:25-55.

Hart, P. 2000. Searching for meaning in children's participation in environmental education. Pages 7-28 *in* B. B. Jensen, K. Schnack, and V. Simovska, editors. Critical Environmental and Health Education: Research Issues and Challenges. Danish University of Education, Copenhagen.

Hart, P. 2003. Teachers' Thinking in Environmental Education: Consciousness and Responsibility. Peter Lang, New York.

Hart, R. A. 1997. Children's Participation: the Theory and Practice of Involving Young Citizens in Community Development and Environmental Care. Earthscan Publications Ltd., London.

Hirsch, B. J. 2005. A Place to Call Home: After-School Programs for Urban Youth. American Psychological Association, Washington, DC.

Hughes, D. M., and S. P. Curnan. 2000. Community youth development: a framework for action. CYD Journal **1**:Online.

Hungerford, H. R., R. A. Litherland, T. L. Volk, J. M. Ramsey, and R. B. Peyton. 1990. Investigating and Evaluating Environmental Issues and Action: Skills Development Program. Stipes Publishing, LLC, Champaign, IL.

Hungerford, H. R., and T. L. Volk. 1990. Changing learner behavior through environmental education. Journal of Environmental Education **21**:8-21.

Jenkins, E. W. 1994. Public understanding of science and science education for action. Journal of Curriculum Studies **26**:601-611.

Jensen, B. B. 2000. Participation, commitment and knowledge as components of pupils' action competence. Pages 219-238 *in* B. B. Jensen, K. Schnack, and V. Simovska, editors. Critical Environmental and Health Education: Research Issues and Challenges. Danish University of Education, Copenhagen.

Jensen, B. B. 2002. Knowledge, action and pro-environmental behaviour. Environmental Education Research **8**:325-334.

Jensen, B. B., and K. Schnack. 1997. The action competence approach in environmental education. Environmental Education Research **3**:163-178.

Jensen, B. B., and K. Schnack. 2004. Assessing action competence? Pages 164-166 *in* W. Scott and S. Gough, editors. Key Issues in Sustainable Development and Learning: A Critical Review. RoutledgeFalmer, London, UK.

Jickling, B. 1992. Why I don't want my children educated for sustainable development. Journal of Environmental Education **23**:5-8.

Jickling, B. 2003. Environmental education and environmental advocacy: revisited. Journal of Environmental Education **34**:20-27.

Jickling, B., and H. Spork. 1998. Education for the environment: a critique. Environmental Education Research **4**:309-327.

Jones, S. 1999. From meta-narratives to flexible frameworks: an actor level analysis of land degradation in Highland Tanzania. Global Environmental Change **9**:211-219.

Kirlin, M. 2003. The Role of Civic Skills in Fostering Civic Engagement. Center for Information and Research on Civic Learning and Engagement (CIRCLE), University of Maryland School of Public Affairs, College Park, MD.

Kirshner, B., J. O'Donoghue, and M. McLaughlin. 2005. Youth-adult research collaborations: bringing youth voice to the research process. Pages 131-156 *in* J. L. Mahoney, R. Larson, and J. S. Eccles, editors. Organized Activities as Contexts of Development. Lawrence Erlbaum Associates, Mahwah, NJ.

Kollmuss, A., and J. Agyeman. 2002. Mind the gap: why do people act environmentally and what are the barriers to pro-environmental behavior? Environmental Education Research **8**:239-260.

Krasny, M. E., and K. G. Tidball. In review. Civic Ecology Education: a systems approach to resilience and learning in cities. Environmental Education Research.

Kyburz-Graber, R. 1999. Environmental education as critical education: how teachers and students handle the challenge. Cambridge Journal of Education **29**:415-432.

Larson, R., D. Hansen, and K. Walker. 2005. Everybody's gotta give: development of initiative and teamwork within a youth program. Pages 159-183 *in* J. L. Mahoney, R. Larson, and J. S. Eccles, editors. Organized Activities as Contexts of Development. Lawrence Erlbaum Associates, Mahwah, NJ.

Lewis, M. E. 2004. A teacher’s schoolyard tale: illuminating the vagaries of practicing participatory action research (PAR) pedagogy. Environmental Education Research **10**:89-114.

Lewis-Charp, H., H. Cao Yu, S. Soukamneuth, and J. Lacoe. 2003. Extending the Reach of Youth Development Through Civic Activism: Outcomes of

the Youth Leadership in Development Initiative. Social Policy Research Associates.

Libby, M., M. Rosen, and M. Sedonaen. 2005. Building youth-adult partnerships for community change: lessons from the Youth Leadership Institute. Journal of Community Psychology **33**:111-120.

MacDonald, G. B., and R. Valdivieso. 2000. Measuring deficits and assets: how we track youth development now, and how we should track it. Pages 149-184 *in* Youth Development: Issues, Challenges and Directions. Public/Private Ventures, Philadelphia, PA.

Mahoney, J. L., R. W. Larson, J. S. Eccles, and H. Lord. 2005. Organized Activities as Developmental Contexts for Children and Adolescents. Pages 3-22 *in* J. L. Mahoney, R. W. Larson, and J. S. Eccles, editors. Organized Activities as Contexts of Development: Extracurricular Activities, After-School and Community Programs. Lawrence Erlbaum Associates, Mahwah, NJ.

Maxwell, J. A. 2005. Qualitative Research Design: An Interactive Approach, 2nd edition. Sage Publications, Thousand Oaks, CA.

McClaren, M., and B. Hammond. 2005. Integrating education and action in environmental education. Pages 267-291 *in* E. A. Johnson and M. J. Mappin, editors. Environmental Education and Advocacy: Changing Perspectives of Ecology and Education. Cambridge University Press, Cambridge, UK.

McComas, K., and J. Shanahan. 1999. Telling stories about global climate change: measuring the impact of narratives in issue cycles. Communication Research **26**:30-57.

McLaughlin, M. W., M. A. Irby, and J. Langman. 1994. Urban Sanctuaries: Neighborhood Organizations in the Lives and Futures of Inner-City Youth. Jossey-Bass, San Francisco, CA.

Mehta, L. 2001. The manufacture of popular perceptions of scarcity: dams and water-related narratives in Gujarat, India. World Development **29**:2025-2041.

Melchior, A., and L. N. Bailis. 2004. Earth Force 2003-04 Program Evaluation. Center for Youth and Communities, Heller Graduate School, Brandeis University, Waltham, MA.

Miles, M. B., and A. M. Huberman. 1994. Qualitative Data Analysis: An Expanded Sourcebook, 2nd edition. Sage Publications, Thousand Oaks, CA.

Mogensen, F. 1997. Critical thinking: a central element in developing action competence in health and environmental education. Health Education Research **12**:429-436.

Mordock, K., and M. E. Krasny. 2001. Participatory action research: a theoretical and practical framework for environmental education. The Journal of Environmental Education **32**:15-20.

Morgan, D. L., and R. A. Krueger. 1998. The Focus Group Kit. Sage Publications, Thousand Oaks, CA.

Moustakas, C. 1994. Phenomenological Research Methods. Sage Publications, Inc., Thousand Oaks, CA.

NAAEE. 2004. Excellence in Environmental Education - Guidelines for Learning (K-12). North American Association for Environmental Education, Washington, DC.

Newmann, F. M. 1975. Education for Citizen Action: Challenge for Secondary Curriculum. McCutchan Publishing Corporation, Berkeley, CA.

NRC. 1996. National Science Education Standards. National Academy Press, Washington, D.C.

NRC. 2000. Inquiry and the National Science Education Standards. National Academy Press, Washington, D.C.

Ospina, S. M., and J. Dodge. 2005. It's about time: catching method up to meaning - the usefulness of narrative inquiry in public administration research. Public Administration Review **65**:143-157.

P/PV. 2000. Youth development: issues, challenges and directions. Public/Private Ventures, Philadelphia, PA.

Pateman, C. 1970. Participation and Democratic Theory. Cambridge University Press, London, UK.

Patton, M. Q. 1990. Qualitative Evaluation and Research Methods. Sage Publications, Inc., Newbury Park, CA.

Pittman, K., M. A. Irby, and T. Ferber. 2000. Unfinished business: further reflections on a decade of promoting youth development. Pages 17-64 *in* Youth Development: Issues, Challenges and Directions. Public/Private Ventures, Philadelphia, PA.

Pring, R. 2000. Philosophy of Educational Research. Continuum, London and New York.

Reid, A., B. B. Jensen, J. Nikel, and V. Simovska, editors. 2007. Participation and Learning: Perspectives on Education and the Environment, Health and Sustainability. Springer, Dordrecht.

Resnick, L. B. 1987. Learning in school and out. Educational Researcher **16**:13-20.

Robottom, I., and P. Hart. 1995. Behaviorist EE research: environmentalism as individualism. Journal of Environmental Education **26**:5-9.

Ross, L., and M. Coleman. 2000. Urban youth as community planners and leaders: exploring their potential with Urban Community Action Planning for Teenagers (UCAPT). PLA Notes **38**:25-28.

Roth, W. M., and J. Désautels. 2004. Educating for citizenship: reappraising the role of science education. Canadian Journal for Science, Mathematics and Technology Education **4**:149-168.

Roth, W. M., and S. Lee. 2004. Science education as/for participation in the community. Science Education **88**:263-291.

Search Institute. 2005. The 40 Developmental Assets. Search Institute, Minneapolis, MN. Retrieved from the World Wide Web February 19, 2007: http://www.search-institute.org/assets/.

Schram, T. H. 2003. Conceptualizing Qualitative Inquiry: Mindwork for Fieldwork in Education and the Social Sciences. Merrill Prentice Hall, Upper Saddle River, NJ.

Schusler, T. M., and D. J. Decker. 2000. Lake Ontario Islands Wildlife Management Area Preliminary Situation Analysis. Department of Natural Resources, New York State College of Agriculture and Life Sciences, Cornell University, Ithaca, NY.

Schusler, T. M., and M. E. Krasny. 2007. Youth participation in local environmental action: an avenue for science and civic learning? Pages Ch. 17 *in* A. Reid, B. B. Jensen, J. Nikel, and V. Simovska, editors. Participation and Learning: Perspectives on Education and the Environment, Health and Sustainability. Springer, Dordrecht.

Schwandt, T. A. 2000. Three epistemological stances for qualitative inquiry: interpretivism, hermeneutics, and social constructionism. Pages 189-214 *in* N. K. Denzin and Y. S. Lincoln, editors. Handbook of Qualitative Research. Sage Publications, Inc., Thousand Oaks, CA.

Schön, D. A. 1991. The Reflective Turn: Case Studies In and On Educational Practice. Teachers College, Columbia University, New York and London.

Scott, J. C. 1998. Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed. Yale University Press, New Haven, CT.

Shavelson, R. J., and L. Towne, Editors. 2003. Scientific Research in Education. National Academy Press, Washington, DC.

Sherrod, L. R., c. Flanagan, and J. Youniss. 2002. Dimensions of citizenship and opportunities for youth development: the what, why, when, where, and who of citizenship development. Applied Developmental Science **6**:264-272.

Simovska, V. 2000. Exploring student participation within health education and health promoting schools. Pages 29-43 *in* B. B. Jensen, K. Schnack, and V. Simovska, editors. Critical Environmental and Health Education Research Issues and Challenges. The Danish University of Education, Copenhagen, Denmark.

Skelton, N., H. C. Boyte, and L. S. Leonard. 2002. Youth Civic Engagement: Reflections on an Emerging Public Idea. Center for Democracy and Citizenship, Hubert H. Humphrey Institute of Public Affairs, University of Minnesota, Minneapolis, MN.

Stern, P. C., and H. V. Fineberg, editors. 1996. Understanding Risk: Informing Decisions in a Democratic Society. National Academy Press, Washington, D.C.

ten Dam, G., and M. Volman. 2004. Critical thinking as a citizenship competence: teaching strategies. Learning and Instruction **14**:359-379.

Tesch, R. 1990. Qualitative Research: Analysis Types and Software Tools. The Falmer Press, New York, NY.

Tompkins, L. 2005. A case for community-based education: students form partnerships to tackle local environmental issues. The Science Teacher **72**:34-36.

Torney-Purta, J., R. Lehmann, H. Oswald, and W. Schulz. 2001. Citizenship and Education in Twenty-eight Countries: Civic Knowledge and Engagement at Age Fourteen. International Association for the Evaluation of Educational Achievement (IEA), Amsterdam, The Netherlands.

Trautmann, N. M., and J. G. MaKinster. 2005. Teacher/scientist partnerships as professional development: understanding how collaboration can lead to inquiry. Pages 1-18 *in* AETS International Conference, Colorado Springs, CO.

UN. 1989. Convention on the Rights of the Child.

UNESCO. 1978. Intergovernmental Conference on Environmental Education Tbilisi (USSR): Final Report. UNESCO, Paris.

UNESCO. 2005a. Decade for Sustainable Development United Nations Decade (2005-2014) - Vision and Definition of ESD. Retrieved January 14, 2007 from the World Wide Web: http://portal.unesco.org/education/en/ev.php-URL_ID=27279&URL_DO=DO_TOPIC&URL_SECTION=201.html/.

UNESCO. 2005b. Education for Sustainable Development UN Decade (2005-2014) - Objectives and Strategies. Retrieved from the World Wide Web January 14, 2007: http://portal.unesco.org/education/en/ev.php-URL_ID=23295&URL_DO=DO_TOPIC&URL_SECTION=201.html/.

Volk, T. L., and M. J. Cheak. 2003. The effects of an environmental education program on students, parents, and community. Journal of Environmental Education **34**:12-25.

Westheimer, J., and J. Kahne. 2004. What kind of citizen? The politics of educating for democracy. American Educational Research Journal **41**:237-269.

Wolcott, H. F. 1994. Transforming Qualitative Data: Description, Analysis, and Interpretation. Sage Publications, Thousand Oaks, CA.

Yankelovich, D. 1991. Coming to Public Judgment: Making Democracy Work in a Complex World. Syracuse University Press, Syracuse, NY.

Yoder, J., and N. Maine. 2000. Educator's Guide to Program Development in Natural Resources: Education as a Community Resource. Northwest Center for Sustainable Resources, Salem, OR.

Youniss, J., S. Bales, V. Christmas-Best, M. Diversi, M. McLaughlin, and R. Silbereisen. 2002. Youth civic engagement in the twenty-first century. Journal of Research on Adolescence **12**:121-148.

Zeldin, S. 2004. Youth as agents of adult and community development: mapping the processes and outcomes of youth engaged in organizational governance. Applied Developmental Science **8**:75-90.

Zeldin, S., L. Camino, and C. Mook. 2005a. The adoption of innovation in youth organizations: creating the conditions for youth-adult partnerships. Journal of Community Psychology **33**:121-135.

Zeldin, S., R. Larson, L. Camino, and C. O'Connor. 2005b. Intergenerational relationships and partnerships in community programs: purpose, practice, and directions for research. Journal of Community Psychology **33**:1-10.

Zeldin, S., A. K. McDaniel, D. Topitzes, and M. Clavert. 2000. Youth in decision-making: a study on impacts of youth on adults and organizations. National 4-H Council, University of Wisconsin Extension, Madison, WI.