

A Follow-Up Study of Eco Education's Environmental Service-Learning Program

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## Abstract

The purpose of the study is to determine student views of the influence of the Eco Education Urban Stewards program's impact on their involvement in community environmental initiatives. Eco Education is a non-profit organization in St. Paul that facilitates an urban, environmental, year-long science curriculum delivered in middle schools in Minnesota. The year-long program ends with an urban, environmental service-learning project. Ten high school students from the Inter District Downtown School who had completed Urban Stewards in middle school took a survey and were interviewed and compared with ten high school students who had a more traditional middle school science experience. Semi-structured oral interviews were conducted with each student. Transcriptions of the interviews were analyzed and compared to the survey results. The survey results were tabulated and given numerical values to compare the Eco Education and non-Eco Education students. Common themes and differences were discovered when comparing the survey results and interview transcriptions of the two groups. Urban Stewards students demonstrated more awareness of environmental issues, concerns and community projects but not by a significant amount.

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## CHAPTER I

### INTRODUCTION

Service-learning is a recognized, powerful method for students to connect what they learn in the classroom to the real world. Service-learning is not a new phenomenon. The idea dates back more than 100 years. Lankard (1995) traces service-learning back to the Progressive Education Movement of the early 1900s. Service-learning was further influenced by the philosophy of experiential learning theorist John Dewey, who believes in learning by doing. Moras (1999) contends that service-learning is closely related to other fields such as outdoor education, environmental education, independent study education, work-study programs, and vocational education.

Service-learning has many different definitions, depending upon the organization or individuals. The Commission on National and Community Service defines service-learning as a method

- (A) under which students learn and develop through active participation in thoughtfully organized service experiences that meet actual community needs and that are coordinated in collaboration with the school and community;
- (B) that is integrated into the students' academic curriculum or provides structured time for the student to think, talk, or write about what the student did and saw during the actual service activity;
- (C) that provides students with opportunities to use newly acquired skills and knowledge in real-life situations in their own communities; and

(D) that enhances what is taught in school by extending student learning beyond the classroom and into the community and helps to foster the development of a sense of caring for others. (National and Community Service Act of 1990)

Waterman (1997) believes “service-learning is an experiential approach to education that involves students in a wide range of activities that are of benefit to others, and uses the experiences generated to advance the curricula goals” (p. xi). The National Youth Leadership Council (2005) defined service-learning as “a method of teaching that enriches learning by engaging students in meaningful service to their schools and communities, and integrating that service with established curricula or learning objectives” (para. 33).

Environmental service-learning combines two areas of education that have roots that extend well back in educational theory, yet until recently had not been at the forefront of educational practice. Environmental service-learning combines environmental education and service-learning. The natural fit between the two has led to a blossoming of environmental service-learning programs across the country.

Environmental education and service-learning complement each other. There has been a rise in the number of environmental service-learning projects around the country.

Supporting the growth in environmental service-learning programs,

service-learning has become an increasingly popular pedagogical method among environmental educators (Ward, 1999). This increase is likely due to the close match between environmental education (EE) goals and service-learning goals.

The primary goal of EE is to provide people with the awareness, knowledge, attitudes, skills and motivations to solve environmental problems (Tbilisi

Intergovernmental Conference on Environmental Education, 1978). Outcomes sought through service-learning include enhancing learning, promoting personal development of values and self-efficacy, fostering civic responsibility, and serving communities (Waterman, 1997). Thus, EE and service-learning share not only the cognitive goal of promoting learning and knowledge, but also the behavioral goal of fostering prosocial and pro-environmental actions (Covitt, 2002, p. 9).

Environmental service-learning uses the environment as an engaging setting for service-learning opportunities. Environmental service-learning is a nontraditional form of education. It takes students out of the classroom and spends less time with textbooks, traditional experiments, and formal tests. Environmental service-learning takes extra preparation time and training to be successful. It is difficult to quantify the learning that takes place outside of the traditional classroom. There is a less identifiable result at the end of the year. For these reasons, environmental service-learning is often bypassed for a more traditional curriculum when designing science programs in middle school. If environmental service-learning has a stronger impact on long-term knowledge, attitudes, and actions regarding the environment than traditional science programs do, it would lead to more environmental service-learning programs and ultimately benefit the environment and society.

Eco Education is a nonprofit organization based in Saint Paul, Minnesota, dedicated to facilitating a yearlong middle school science curriculum called Urban Stewards. The Urban Stewards program culminates with an urban environmental service-learning project. Eco Education's staff assists with training middle school teachers and

facilitates the delivery of the Urban Stewards curriculum. Middle school science teachers are responsible for the program delivery.

Evaluation of environmental service-learning programs most frequently relies on tools administered immediately following the experience. Rarely does the environmental service-learning program staff receive feedback of the long-term benefits of an environmental service-learning experience.

This study examines the impact and long-term effects of an environmental service-learning curriculum on high school students who experienced the Urban Stewards program in middle school. The study compares Urban Stewards recipients to high school students from the same high school who experienced a different middle school science program.

### **Rationale**

Practitioners of environmental service-learning programs understand the power of combining service-learning and the environment, and they witness the impact of the program on students. Evaluations of environmental service-learning programs that occurred immediately following the programs demonstrated that students showed improved academic performance, positive attitudes toward the environment, and greater participation in community environmental issues (e.g., Furco, 2002; Holt, 1988; Lieberman & Hoody, 1998; Melchior & Bailis, 2002; Ramsey, 1987; Ramsey, Hungerford, & Tomera, 1981; Weiler, LaGoy, Crane, & Rovner, 1998). Very few studies have focused on the long-term impact of environmental service-learning programs. While teachers may intuitively believe in the long-term impact, there is little empirical data to support this belief. Is there any difference in environmental community



responsibility, and in personal actions and aspirations to improve the environment between students who experience environmental service-learning programs as compared with students who do not have such an opportunity?

### **Purpose of the Study**

The purpose of the study is to compare the influence of student participation in the Urban Stewards program to nonparticipation. Students were asked to reflect on their middle school science experiences and how those experiences impacted their views of their own participation in environmental activities. High school students were questioned on their knowledge of community environmental issues, environmentally responsible behaviors, and participation in community environmental initiatives.

Few studies have focused on students more than one year after the conclusion of a program. In the introduction to *Studying Service-Learning: Innovations in Education Research Methodology*, Billig maintains that “currently, too few studies ... are longitudinal in nature” (Billig & Waterman, 2003, p. ix). Howard (2003) states

researchers know a fair amount about the effects of service-learning on students during their period of participation, but much less about the long-term impacts of participation. Do students become lifelong civic participants as a result of their involvement in service-learning? How else are they influenced over the long run?  
(p. 8)

Furco (2003) contends that “service-learning studies should investigate outcomes and impacts in a more longitudinal vein whereby the long-term impacts of service-learning are investigated” (p. 20).

Stanton, Giles, and Cruz (1999) support this idea, saying, “Many called for impact analysis research on students, communities, and institutions. Jim Keith suggests case studies ‘to capture the lives of students longitudinally in terms of their commitment’” (p. 223). These specific views and research perspectives contribute to the proposed study of the long-term impact of environmental service-learning on students.

The North American Association for Environmental Education (2005) stated Environmental education is rooted in the belief that humans can live compatibly with nature and act equitably toward each other. Another fundamental belief is that people can make informed decisions that consider future generations. Environmental education aims for a democratic society in which effective, environmentally literate citizens participate with creativity and responsibility (para. 4).

Students involved with the Eco Education program had the opportunity to become environmentally literate and to make informed decisions about the environment. Did the program have a long-lasting impact? Do students believe they can make a difference in the future? Do they care about the environment?

### **Research Questions**

This study focuses on surveying and interviewing 20 students. Ten students completed the Urban Stewards program facilitated by Eco Education. Ten students had a more traditional science experience in middle school. This study attempts to determine what, if any, perceived impact the Urban Stewards program had on students’ views, actions, and future aspirations regarding the environment, as compared to those who had not had an Eco Education experience. The specific research questions are:

1. In what ways do students view participation in the Eco Education Urban Stewards program influences knowledge of community environmental issues?
2. In what ways are Eco Education students demonstrating environmentally responsible behaviors?
3. In what ways does Eco Education student participation in community environmental initiatives differ from students not participating in the Eco Education program?

### **Definition of Terms**

***Environmental education***—“Through environmental education, people gain an understanding of how individual actions affect the environment, acquire skills to weigh various sides of issues, and become better equipped to make informed decisions” (U.S. Environmental Protection Agency, 2010, para. 12).

***Environmental issues***—Environmental issues include recycling efforts, global warming, clean air, clean water, and saving energy.

***Environmental service-learning***—Madigan (2000) defines it as an educational strategy linking youth with service opportunities in the local environment, neighborhood, or community. The hands-on and outdoor elements have the added value of connecting youth to issues of environmental sustainability and positive change through civic stewardship. Projects ... connect the human and natural communities—and, involve long-term commitment (civic stewardship) and follow-up (p. 11).

***Experiential education***—“Experiential education is a philosophy and methodology in which educators purposefully engage with learners in direct experience and focused reflection in order to increase knowledge, develop skills, and clarify values” (Association for Experiential Education, 2005, para. 3).

***Interdisciplinary***—Teaching method or strategy that uses more than one discipline to examine a theme or issue.

***Middle school***—A school between elementary school and high school, usually having three or four grades. For this study, middle school includes grades six through

eight. A middle school takes into account the unique characteristics of young adolescents with a philosophy that includes advisories, hands-on learning, and experiential learning.

***Service-learning***—The National Commission on Service Learning defined it as a form of experiential education where learning occurs through a cycle of action and reflection as students work with others through a process of applying what they are learning to community problems and, at the same time, reflecting upon their experiences as they seek to achieve real objectives for the community and deeper understanding and skills for themselves (as cited in Eyler & Giles, 1999, p. 45).

## CHAPTER II

### REVIEW OF THE LITERATURE

The review of the literature encompasses the bodies of knowledge of service-learning, environmental education, experiential education, and environmental service-learning. It is important to explore the historical as well as the theoretical foundations of these areas of educational practice and delivery. This chapter also examines previous research and current practice and approaches.

#### **Historical Perspectives**

##### **Service-Learning**

There are varied opinions to the origins and background of service-learning. Kennedy (1991) states

Service learning is a time-tested educational tool that traces its lineage back to John Dewey. It helps students understand the relevance of their coursework and enables them to test their classroom work against the reality of the world around them.... There are few better ways to inspire a child's interest in science than by allowing him or her to analyze and clean up a polluted stream (p. 772).

Moras (1999) explains that "service-learning grew out of the experiential learning field about thirty years ago. It is related to the fields of outdoor education, environmental education, adventure education, independent study education, work-study programs, and vocational education" (p.40). Stanton, Giles, and Cruz (1999) identify 27 strands of service-learning practice in their book, *Service-Learning: A Movement's Pioneers Reflect on Its Origins, Practice, and Future*. Service Learning "developed out of concerns expressed in the sixties and seventies for active, experiential learning opportunities

related to community service, community development and social change' (Stanton 1988, 345)" (p. 40).

The National Service-Learning Partnership described a brief history of service-learning and national service in the country that began with the New Deal, when Franklin D. Roosevelt created the Civilian Conservation Corps. In 1961, John F. Kennedy established the Peace Corps, which trained volunteers to serve in undeveloped countries. This was followed in 1964 by Lyndon B. Johnson's creation of VISTA (Volunteers in Service to America). The 1980s saw the advent of service in schools. Campus Outreach Opportunity League and Campus Compact developed to facilitate service programs in higher education, while the establishment of the National Youth Leadership Council and Youth Service America promoted service for students in K-12 and beyond.

The passing of the National and Community Service Act in 1990 supplied funding to schools, universities, and nonprofits and led to the National and Community Service Trust Act of 1993, which expanded opportunities for service. This led to the creation of the Corporation for National and Community Service. The grants from this organization have funded service-learning opportunities in schools.

The establishment of the Elementary and Secondary Education Act in 1965 and its reauthorization in 1994 to include service-learning components provided federal funds for service-learning projects that were connected to goals of other titles. The reauthorization of this in 2002 as the No Child Left Behind Act secured continued federal funding for service-learning programs. Lankard (1995) states that

Legislative reform over the past 10 years has set in motion a growing national emphasis on increasing students' involvement with their local communities and

linking this service to academic study through service-learning. The National and Community Service Act of 1990, through the Serve America program, and the National and Community Service Trust Act of 1993, through the Learn and Serve America program, provided support for service-learning activities in elementary and secondary schools (Corporation for National Service, 1999). In addition, through programs such as AmeriCorps, the federal government has offered opportunities to high school graduates to serve local communities in exchange for stipends and payment of education loans or money toward future postsecondary education. Both Learn and Serve America and AmeriCorps are administered by the Corporation for National Service, a federal organization also created by the National and Community Service Trust Act of 1993 (p. 2).

### **Environmental Education**

According to Athman and Monroe (2001), the origin of the environmental education movement can be traced back to the nature-study movement, to John Muir and Enos Mills and their studies of plants and animals in the late 1800s. Wilbur Jackman wrote *Nature Study for the Common Schools* in 1891 to educate urban dwellers who had lost touch with the natural world. Junior naturalist programs and handbooks for teaching natural history abounded in the early 20th century, promoting an understanding of nature and agriculture.

Conservation education came to the fore in the 1930s around the issues of soil erosion, dust storms, and flooding (Athman & Monroe, 2001). One of the pioneers of environmental education was Aldo Leopold, a professor from Wisconsin. The Leopold Education Project put together by Pheasants Forever believed that momentous changes



had occurred within society during the previous few decades: “Increased urbanization has led to a citizenry apart from the land community ... education is the primary method of achieving not only land wealth but also a sense of community and harmony” (Leopold, 1949, p. 96). Leopold saw these changes developing over 50 years ago and became a strong advocate for teaching children and adults to develop a land ethic or to

create an ecologically literate citizenry, to heighten students’ awareness of the natural world while fine-tuning the skills necessary to read the landscape, and to instill love, respect, and admiration for the land in order to create a personal land ethic in each individual (Leopold, 1949, p. 6).

Nuclear testing and the introduction of Rachel Carson’s book *Silent Spring* in 1962 “made people more aware of ‘unseen forces’ that could affect the environment in negative ways, such as nuclear fallout or modern agricultural practices (Athman & Monroe, 2001, p. 28).

Environmental Education began to take a strong hold in 1970 with the first Earth Day celebration, which closely followed the publication of the *Journal of Environmental Education* in 1969. Gaylord Nelson, a former U.S. senator and governor of Wisconsin, founded Earth Day. Many people consider him the modern-day founder of environmental protection in the U.S. As a U.S. senator, he cosponsored the National Environmental Education Act, which reflected a national commitment to environmental education. He also helped write and pass legislation to ban the use of DDT and the defoliant Agent Orange, to control strip mining, and to preserve numerous scenic areas of the United States.

Moras (1999) contends that social and political developments added to the environmental education movement.

Widespread environmental abuses were also discovered in the 1960's and 1970's and raised public consciousness which spread to form the Environmental Movement. The first Earth Day in 1970 saw successive waves of activism and local, state, and national legislation for better environmental protection, natural resource management, and land use planning practices. The passage of significant civil rights legislation during the same ten-year period can also be credited to dynamic grassroots movements which prompted our executive and legislative branches of government into action (p. 15).

In the 1990s, guidelines and standards were created and refined. Simmons et al. (1998) found that

The National Project for Excellence in Environmental Education, sponsored by the North American Association for Environmental Education (NAAEE), was initiated in 1993 to facilitate the development of a model set of guidelines for environmental education. As such, it joins the many standards projects for such disciplines as Mathematics, English, Language Arts, Geography, Science, Civics and History developed in response to the "Goals 2000" process (p. 81).

In 1990, the National Environmental Education Act reinforced the ideals of the Environmental Education Act of 1970, encouraging both schools and informal ways of educating people about the environment.

The United Nations Educational, Scientific and Cultural Organization (UNESCO) is a pioneering organization in the field of environmental education and research.

UNESCO was created on December 14, 1945, to serve the cause of world peace and humankind by means of cooperation in the fields of education, science, and culture.

As early as 1948, UNESCO promoted future environmental research by means of establishing scientific programs (Goerke\Erdmann, 1990). With the development of Man and the Biosphere (MAB) in 1970, UNESCO created the first interdisciplinary global scientific program that included economic, social, cultural, educational and ethical as well as environmental research (Kastenholz & Erdmann, 1994, p. 15).

According to the United Nations Environment Programme (UNEP) website

Environmental Education (EE) gained international recognition in 1972 with the UN Conference on the Human Environment, in Stockholm, Sweden, which called upon Environmental Education as the means to address environmental issues worldwide. The world's first Intergovernmental Conference on Environmental Education, Tbilisi, Georgia (USSR), organized by UNESCO in partnership with UNEP in 1977, highlighted the important role of EE in the preservation and improvement of the world's environment, as well as in the sound and balanced development of the world's communities. Ten years later, in 1987, UNESCO and UNEP organized an International Congress in Moscow, USSR in order to determine an international strategy for “action in EE and training” for the 1990s. This was followed by a third conference held at Thessaloniki, Greece in 1997 which highlighted the role of education and public awareness for achieving sustainability. In 1992, in order to assess 20 years of work in the field of environment following the 1972 Stockholm conference, the UN organised a

Conference on Environment and Development (UNCED), also called the Earth Summit at Rio de Janeiro, Brazil. The outcomes of this conference were crystallized in Agenda 21 in which Chapter 36, entitled “Promoting Education, Public Awareness and Training”, established the basis for action in EE for Sustainable Development for the years to come. Ten years later, in September 2002, the UN organised the World Summit on Sustainable Development (WSSD) in Johannesburg, South Africa to assess progress made in this direction on a worldwide basis (UNEP, 2007, para. 1).

In 1993, the Minnesota Environmental Education Advisory Board (MEEAB) was created to write a state plan for environmental education, to define the term and develop statewide goals. In this plan, the GreenPrint for Minnesota, MEEAB identified the mission of environmental education for the state. That mission was “to develop a population that has the knowledge, skills, attitudes, motivation, and commitment to work individually and collectively toward sustaining a healthy environment” (Carlson, Jasper, & Otterson, 1997, p. 9). “The Minnesota Department of Education recognizes this [the importance of environmental education] by including environmental education in the state’s graduation standards” (Carlson, Jasper, & Otterson, 1997, p. 10).

The Minnesota Legislature recognized the importance and need for environmental literacy among its citizens in 1990 by passing the Minnesota Environmental Education Act. This act outlined seven outcome-based goals for environmental education in the state. These goals corresponded to the framework domains set by the North American Association for Environmental Education (NAAEE) and the National Consortium for Environmental Education and Training (NCEET).

1. To understand ecological systems. (knowledge domain)
2. To understand the cause and effect relationship between human attitudes and behaviors and the environment. (knowledge domain)
3. To be able to analyze, develop, and use problem-solving skills to understand the decision-making process of individuals, institutions, and nations regarding environmental issues. (skills domain)
4. To be able to evaluate alternative responses to environmental issues before deciding on alternative courses of action. (skills domain)
5. To understand the potential complementary nature of multiple uses of the environment. (knowledge domain)
6. To provide experiences to assist citizens to increase their sensitivity and stewardship for the environment. (affective domain)
7. To provide the information citizens need to make informed decisions about actions to take on environmental issues (responsible environmental behavior domain) (Carlson, Jasper, & Otterson, 1997, p. 8).

Since the mid-1990s Minnesota's environmental education programs have focused on student awareness, attitudes, skill development, and citizenship participation. Service-learning, introduced more recently, has helped to shape environmental education program goals statewide.

## Theoretical Foundations

### Service-Learning

Brown (2001) contends that the rationale behind incorporating service-learning into education is generally twofold. First, the service-learning activity is understood as “experiential learning,” and the basis for including such experiential educational activities draws on pedagogical theory from such thinkers as John Dewey. The second rationale for incorporating service as the experiential activity draws on theories that suggest that a significant part of education should be civic educating, and tying community service to education is a form of teaching “civic engagement” and the “ethic of service” to students (p. 10).

John Dewey was a strong proponent of civic engagement, as Brown described:

In *Democracy and Education*, Dewey writes: “Upon the educational side, we note first that the realization of a form of social life in which interests are mutually interpenetrating, and where progress, or readjustment, is an important consideration, makes a democratic community more interested than other communities have cause to be in deliberate and systematic education” (p. 87).

Dewey’s main line of argument regarding education is that in a democratic society, pluralism and diversity, as well as experience and participation in social and political activities define the health of the democracy. Consequently, as a public instrument of that society, education should foster, promote, and enact those democratic qualities as much as possible (pp. 10–11).

While the origins of service-learning go back over a century, it has only recently come to the forefront of education. Lankard (1995) states

Service-learning has long been viewed as a possible means of improving education, with roots stretching back to the late-19th and early 20th century. For example, John Dewey, believed that students would learn more effectively and become better citizens if they engaged in service to the community and had this service incorporated into their academic curriculum (Dewey, 1916). Though first suggested over a century ago, the incorporation of service-learning into the curriculum did not begin in earnest until the early 1970's and it has only been in the last decade that extensive reform efforts have emerged (p. 2).

### **Experiential Education**

John Dewey, one of the most influential educational theorists, is often considered the founder of modern experiential learning theory. Dewey believes in the power of experience; he claims that “the fundamental unity of the newer philosophy is found in the idea that there is an intimate and necessary relation between the processes of actual experience and education” (as cited in Kolb, 1984, p. 5). He believes that “the best way people learn is centered on interaction (between people and the environment), reflection and experience, combined with a keen interest in community and democracy” (Karls, n.d.). Dewey considers reflection and experience to be a powerful combination in education, but the learner needs to have direct experiences. “The learner is directly in touch with the realities being studied. It involves direct encounter with the phenomenon being studied rather than merely thinking about the encounter or only considering the possibility of doing something with it” (Kolb, 1984, p. 5).

Kurt Lewin, founder of American social psychology, believes that “learning is best facilitated in an environment where there is dialectic tension and conflict between immediate, concrete experience and analytic detachment” (Kolb, 1984, p. 9). He believes in the concept of simulation as being a valuable experiential learning model.

Jean Piaget had a great influence on experiential learning. He believes that intelligence is not an innate internal characteristic of the individual but arises as a product of the interaction between the person and his or her environment. Piaget thought of the growth of knowledge as a progressive construction of logically embedded structures. These structures build upon one another by a process of inclusion of lower, less powerful logical means into higher and more powerful ones up to adulthood (Karls, n.d.).

David Kolb (1984) designs a model of experiential learning, drawing on the philosophies of Dewey, Lewin, and Piaget. His model is based on a four-element cycle. The steps of the cycle include (a) concrete experience, (b) reflective observation, (c) abstract conceptualization, and (d) active experimentation. Morse (2001) contends that

Building on early fundamentals from educational science proposed by John Dewey in 1928, the work of Kurt Lewin... along with a complementary effort in the area of learning dynamics by Jean Piaget ... provide the theoretical underpinnings for the concept of experiential learning (Morse, 1977). Resting on this foundation of strong intellectual rigor, Kolb (1984) integrates not only these basics, but also sets out the fundamentals of what might be called the Experiential Learning Model (p. 153).



## **Environmental Education**

Much of the present theory and work in environmental education is based on two major documents: the Belgrade Charter and the Tbilisi Declaration. The Belgrade Charter was adopted by a United Nations conference in 1975 at the International Conference on Environmental Education in Belgrade, Yugoslavia. It states:

The goal of environmental education is to develop a world population that is aware of, and concerned about, the environment and its associated problems, and which has the knowledge, skills, attitudes, motivations, and commitment to work individually and collectively toward solutions of current problems and the prevention of new ones (Global Development Research Center, 2004).

From this conference, UNESCO established the International Environmental Education Program for a 10-year period between 1975 and 1985.

As with experiential education, environmental education has its theoretical roots in the work of Dewey and Piaget and is based on hands-on learning. Athman and Monroe (2001) contends that

educational programs and curricula should be developed in response to the theories of learning, such as Piaget's theory of cognitive development and constructivism.... In order for environmental education programs to be effective in an educational sense, they must also be congruent with the way people learn (p. 42).

Piaget's four cognitive stages that children progress through include sensorimotor, preoperational, concrete operational, and formal operational. Children pass from one stage to the next as a function of experience and maturation (Athman & Monroe, 2001, p. 43). According to Athman and Monroe, "applied to environmental education, curricula should be developed so that they facilitate stage-relevant thinking and allow students to discover for themselves the logical connections between objects or events" (p. 43).

Constructivism contends that students construct knowledge built upon previous knowledge. The context of their learning must be relevant and take into account knowledge acquired outside of the regular classroom environment. Students constantly construct and reorganize information (Athman & Monroe, 2001).

Adkins and Simmons (2003) asserts that the definition of environmental education has evolved.

It began to take concrete form with the publication of the "Journal of Environmental Education" in 1969, celebration of the first Earth Day in 1970, and the passage of the National Environmental Education Act in 1970. For many educators, however, environmental education begins with the two founding documents: The Belgrade Charter ... and the Tbilisi Declaration....

From these two statements, Hungerford, Peyton, and Wilke (1980) proposed the superordinate goal of environmental education: to aid citizens in becoming environmentally knowledgeable and, above all skilled and dedicated citizens who are willing to work, individually and collectively, toward achieving and/or maintaining a dynamic equilibrium between quality of life and quality of the environment (p. 3).

### **Interrelatedness of Goals**

Service-learning, experiential learning, and environmental education have very similar goals and practices. All three strive for hands-on learning where students attempt to make connections and construct knowledge based on their interactions with the world around them. Students get out of the normal classroom environment and experience firsthand their natural environment. They are given the opportunity to connect their previous experience with classroom instruction and put it into practice to construct a new knowledge base. They are actively doing rather than just passively receiving information to assist in their learning. Students are engaged and interacting with that which they are also learning about in the classroom.

McAleavey (1996) compared experiential learning and service-learning by suggesting that

One of the primary differences between experiential learning ... and service-learning is that the focus of experiential learning is often on the benefit to students, whereas the focus in service-learning is twofold. Service-learning is reciprocally beneficial, with meaningful service being provided to the community and meaningful learning experiences provided for the student. "Service-learning programs emphasize the accomplishment of tasks which meet human needs, in combination with conscious educational growth" (Kendall, 1990, p. 40 p. 1).

While service-learning and experiential education are ways of teaching or processes used to teach, environmental education has a “focus on developing the ‘core concepts’ and ‘skills’ that environmentally literate citizens need for responsible action” (Adkins & Simmons, 2003, p. 3).

Environmental education and service-learning complement each other. There has been a rise in the number of environmental service-learning projects around the country. Covitt (2002) suggests that

service-learning has become an increasingly popular pedagogical method among environmental educators (Ward, 1999). This increase is likely due to the close match between environmental education (EE) goals and service-learning goals. The primary goal of EE is to provide people with the awareness, knowledge, attitudes, skills and motivations to solve environmental problems (Tbilisi Intergovernmental Conference on Environmental Education, 1978). Outcomes sought through service-learning include enhancing learning, promoting personal development of values and self-efficacy, fostering civic responsibility, and serving communities (Waterman, 1997). Thus, EE and service-learning share not only the cognitive goal of promoting learning and knowledge, but also the behavioral goal of fostering prosocial and proenvironmental actions (p. 9).

Madigan (2000) asserts that “there are many characteristics that contribute to the good fit between service-learning and environment in youth/community partnerships. Haselkorn and De Grandi (1999) comment that environmental education and community service-learning helps students make connections between what they learn and how they live” (p. 10).

The Belgrade Charter's and the Tbilisi Declaration's objectives and guiding principles align closely with the goals of service-learning, making them a perfect educational fit. The instance of environmental service-learning programs is increasing at all levels in education as teachers realize its potential as a powerful way to provide hands-on thematic programs to students. Madigan (2000) states that

The marriage of environmental studies and service-learning in higher education has been called a natural fit (Ward, 1999). The rationale for combining environmental education and service-learning can be explored following a similar path. Environment can transcend subject matter and be used as an integrating theme for instruction (Lieberman & Hoody, 1998). The trend of thematic, integrated learning in environmental partnerships needs to be linked to the development of national service initiatives, organizational collaboration, and program design—to ensure that the marriage lasts (p. 8).

## **Previous Research**

### **Research on Service-Learning**

While the body of research in the field of service-learning has grown significantly, there are challenges inherent in the discipline. Furco (2003) found that All service-learning activities, regardless of their overall design and programmatic goals, involve a complex interaction of students, service activities, curricular content and learning outcomes. What results are highly idiosyncratic, situational experiences for which there is minimal predictability of how each service-learning experience will unfold. Indeed, no two service-learning activities are alike. Such idiosyncrasy and unpredictability has significant implications for how one should

approach the study of service-learning.... Most of the more than 100 published studies of service-learning have been unable to make definitive statements about the impacts of service-learning on students, teachers, schools and communities (p. 13).

Previous studies have attempted to find links between service-learning and positive attitudes, skills, and responsibility. Covitt (2002) found that research over the past decade has provided growing bodies of evidence that service-learning can positively influence prosocial, or civic outcomes. Studies have found that students who participate in service-learning may develop higher levels of civic responsibility and willingness to become involved in community service (e.g., Furco, 2002; Melchior & Bailis, 2002; Weiler, LaGoy, Crane, & Rovner, 1998). Studies of environmental service-learning and similar environmental education programs that emphasize real world environmental problem-solving have also found positive outcomes for increasing environmental responsibility and commitments (e.g., Holt, 1988; Lieberman & Hoody, 1998; Ramsey, Hungerford, & Tomera 1981; Ramsey 1987) (p. 9).

Billig's research brief for the organization Learning In Deed also found evidence to support the development of students' sense of civic and social responsibility and their citizenship skills:

- Students who engaged in high quality service-learning programs showed an increase in the degree to which they felt aware of community needs, believed that they could make a difference and were committed to service now and later in life (Melchior, 1999; Berkas, 1997).

- High school students who participated in high quality service-learning programs developed more sophisticated understandings of socio-historical contexts, were likely to think about politics and morality in society and were likely to consider how to effect social change (Yates and Youniss, 1996; 1998).
- Elementary and middle schools students who participated in service-learning developed a greater sense of civic responsibility and ethic of service (Stephens, 1995).
- Students who engaged in service-learning increased their understanding of how government works (Berkas, 1997).
- High school students who participated in service-learning and service are more likely to be engaged in a community organization and to vote 15 years after their participation in the program than those who did not participate (Youniss, et. al., 1997; Yates and Youniss, 1998).
- High school students from five states who participated in high quality service-learning programs increased their political attentiveness, political knowledge and desire to become more politically active (Morgan and Streb, 1999).
- Students who engage in service-learning feel that they can “make a difference” (O’Bannon, 1999; Cairn, 1999).
- Over 80 percent of participants in high quality service-learning programs felt that they had made a positive contribution to the community (Melchior, 1999; Billig and Conrad, 1997; Scales and Blyth, 1997). (Billig, n.d.)

Moras (1999) states that

Eyler, Giles and Schmiede (1996) were interested in researching the impact of service-learning on students' citizenship values, skills, attitudes, and understanding. Participation in service-learning had a significant impact on increases in many outcomes over the course of a semester. Positive interaction with faculty outside the service-related experiences contributed independently to growth on most outcomes measures. Previous experience often made a difference on outcomes. "It would appear that the effects of service are cumulative; students who have participated continue to gain from that experience" (pp. 49–50).

Moras (1999) points out that "further research is needed to validate the ability of service-learning to improve learning for at-risk students via participation in environmental restoration programs" (p. 5). He also states that "environmental restoration service-learning has received scant attention by academic researchers" (p. 5).

Experts in the field of service-learning research agree on the need for new research to be conducted, especially looking at the effects of service-learning over time. Stanton, Giles, and Cruz (1999) suggest that

Numerous pioneers called for research to identify instructional strategies that ensure that "service combined with learning add value to each and transforms both" (Honnet and Poulsen, 1989). Many called for impact analysis research on students, communities, and institutions. Jim Keith suggests case studies "to capture the lives of students longitudinally in terms of their commitment" (p. 223).

Shumer, in a chapter from *Service Learning: Applications from the Research* (1997), suggests that while "we understand a lot, there is still much more to learn. We need to



understand the long-term effect of service-learning on social and civic behavior” (p. 25) Andersen (1998) concurred, “Continued research is needed, especially focused on well-implemented Service Learning, on experiments that randomly assign students to Service Learning or to other pedagogical approaches within the same (or comparable) courses, and on large-scale longitudinal studies” (para. 12).

While some longitudinal studies in the area of service-learning originated in middle and high schools, many came from higher education. Andersen (1998), on the Communitarian Network website, describes a few of the major national studies. The Brandies study conducted by Melchior in 1997 performed both pretest and posttest measures on approximately 1000 students from a variety of high schools and middle schools. Service programs included were well implemented and included more than 60 hours of service each semester. Findings in this study demonstrate no negative impacts and several positive impacts on most service-learning indices.

The Vanderbilt study by Eyler et al. in 1997 involved over 1500 students from 20 colleges and universities—large and small, public and private—from around the country. Service-learning was integrated into the curriculum, and students were compared on pretest and posttest measures with control students who chose a different option. Researchers found effects emerged in the areas of citizenship confidence, values, skills, and perceptions of social justice.

Sax and Alexander conducted a long-term longitudinal study of more than 12,000 college freshmen that began in 1985 then followed up with the students in 1989 and 1994. This study, published in 1997, shows that participation in community service

in college led to activism and volunteerism five years after graduating from college. There is an enhanced ethic of service found in this follow up study (Andersen, 1998).

While some of these studies were longitudinal in nature, and some involved middle school students, none of the studies involved middle school students in environmental service-learning. Many issues have led to a lack of follow-up studies on environmental service-learning programs.

### **Environmental Education Research**

Marcinkowski and Mrazek (1991) report that Jans in 1982, while studying the effects of providing environmental education to elementary and middle school students, found that “through environmental education programs, student attitudes concerning the environment can be changed in a positive fashion” (p. 103). Other studies find that while students know their facts fairly well, they often have difficulty using these facts to look at a problem from different perspectives.

Environmental educators have to do a great deal to raise the level of environmental knowledge of high school students ... although recognition of a problem is the first step toward higher level understanding, it is insufficient for comprehending the repercussions of environmental problems or proposing appropriate solutions for these problems. Teachers have the opportunity to use students’ concerns as a source of motivation. In addition, teachers can take advantage of what students know about environmental issues and develop isolated pieces of information into concepts that can be used for critical thinking (Gambro & Switzky, 1996, p. 32).

More recent documents have refined the definition and goals of environmental education.

In recent years, the focus of much scholarly work in EE has been on describing the precursors of responsible environmental citizenship and environmental literacy. That is, what are the types of knowledge, skills and dispositions that describe the environmentally literate citizen (Simmons et al., 1999, p. 83).

Duffin (2005) compiled a list of recent studies about the effects of environmental education for the Place-Based Education Evaluation Collaborative (PEEC) Another name for place-based education is environment-based education, which uses the environment as an integrating context (EIC). Bartosh (2004) statistically compared 77 pairs of similar schools, some that had been implementing environmental education for at least three years and some that had no programs or had just started environmental education programs. Using standardized tests (Iowa Basic Skills and Washington Assessment of Student Learning), Bartosh found that over the course of 5 years (1997–2002), schools with environmental education programs showed higher, statistically significant standardized test scores in math, reading, writing, and listening.

Lieberman and Hoody (1998) researched 40 EIC programs in 12 different states through interviews, surveys, and 14 comparisons with traditional programs. The findings in this study included higher scores on standardized tests and higher GPAs as well as greater pride in their work, reduced discipline, and increased engagement. In the 14 comparisons with traditional programs, EIC programs demonstrated better performance in 36 of 39 measures. Athman and Monroe (2004) studied 400 students in grades 9 and 12 in eleven Florida high schools. They used norm-referenced tests and interviews with

some of the students. When controlled for GPA, gender, and ethnicity, EIC students had higher scores on all of the tests. Students had higher achievement motivation, which Athman and Monroe attributed to learning experiences that were tailored to students' interests and strengths and the ability to apply their knowledge and information to real-life issues.

Increased self-esteem, conflict resolution skills, problem solving, and motivation to learn, as well as improved science scores on posttests, were found in a study conducted by the American Institutes for Research (2005). Recfication with sixth-grade students and used a delayed-treatment design. Findings showed no significant change, however, with scores relating to environmental stewardship. After its first year, 10 middle schools participating in EIC programs in South Carolina showed improvement in the areas of attendance, behavior, and academic achievement. This study by Falco (2004) is ongoing.

Hoody (1995) conducted a study locating recent research in the environmental education field. She summarizes studies that used decision-making and problem-solving processes as well as learning content. She found three major classifications of research projects. These included studies that examined both knowledge and attitudes, attitudes only, and behavior. Relevant reports found in this study include Ramsey and Rickson, who suggested that "increased knowledge about the cause of pollution generates more positive attitudes toward corrective measures" and that "knowledge may lead to the beginning formation of attitudes which in turn leads to further knowledge acquisition" (cited in Iozzi, 1984, p. 6). This appears to be a common but unproven theme in environmental education literature.

Hoody (1995) reports that positive impacts on attitudinal changes were found in articles by Janus in 1982 and Hepburn in 1984.

One of the few reports to measure a program's longitudinal impact on attitudes was conducted for the outdoor science school of the Orange County (California) Department of Education. During the 1975-76 school year 3,278 sixth graders attended the Forest Home Outdoor School. The researcher located seniors at local high schools who had attended the outdoor school during 1975-76. Surveys were received from 449 students (13% of the enrollment). Ten topics were represented by questions on the instrument including: Interest in natural sciences, appreciation of the environment, peer and cabin leader relationships, interest in camping, impact on attitude toward home responsibilities, feelings about conservation/preservation and potential value of outdoor school for other students.

Overall the Orange County data indicates a positive impact on the students. Pie charts displayed students' responses that indicated a 59% increased interest in natural sciences; 80% increase appreciation for the environment; increased positive feelings about conservation and preservation of wilderness and national forest areas were developed by 77% of the students (p. 9).

Hoody (1995) also contended that there is a growing effort among environmental educators to develop a citizenry that both behaves responsibly and is actively working to protect the environment. Roth, Stapp, Hungerford and Peyton (cited in Hines, Hungerford and Tomera, 1986) state that the development of

environmentally responsible behavior (ERB) and active citizens has become the ultimate goal of environmental education....

A program called issue investigation and action training (IIAT) was designed to focus on development of responsible environmental behavior....IIAT was reported to promote ERB, in populations of eighth graders, when EE instruction focused on predictor variables of responsible environmental behavior (pp. 9–10).

Hoody notes that nearly parallel findings were record by Ramsey in 1993 when studying eighth-grade students to study the influence of an IIAT program using interdisciplinary modules.

### **Environmental Service-Learning Research**

In her study for the Higher Education Research Institute, Vogelgesang investigated entering college students in 1994, followed up with students in 1998. Vogelgesang also surveyed postcollege students in 2004. Astin, Sax, and Avalos (1999) used pre- and postsurveys too in their study, which assessed the long-term effects of volunteerism during the undergraduate years. Hill, Brandenberger, and Howard (2005) conducted a longitudinal study looking at the impact of service-learning. They compared a random sample of undergraduates who took part in the 1987 Summer Service Project at Notre Dame to a control group approximately 10 years after leaving college. The follow-up study looked at commitment to a life of service, relationship to society, spirituality, and growth. They conducted scripted interviews by phone that lasted between 20 and 45 minutes.

Environmental service-learning is complicated to assess and evaluate because of its interdisciplinary nature. Hoody (1995), in her study *The Educational Efficacy of Environmental Education*, found that

interdisciplinary-based research in EE is poorly represented in the literature....

There are several possible explanations for a lack of research that reinforces the pedagogical strengths of EE. Among the possible reasons are: lack of funding and/or planning for program evaluation; difficulties incorporating assessments of problem-solving and critical-thinking skills into traditional school structures; lack of relevant case examples of interdisciplinary model programs; and most EE researchers are evaluating program outcomes related to environmental attitudes and behaviors rather than assessing general educational impacts of EE (p. 18).

Moras (1999) pointed out some of the constraints surrounding research into service-learning outcomes:

Students are rarely, if ever, randomly assigned to participation in service-learning activities. They engage in them by choice. Also, control or comparison groups are not readily available. A further constraint is the small number of standardized instruments that exist by which to measure program effects (Giles, Honnet, and Migliore 1991). The short duration and limited intensity of many service programs have made it difficult to conduct longitudinal studies of participants' attitudes, behaviors, and perceptions, especially those related to social responsibility, sense of efficacy, and commitment to civic participation. "Social responsibility is ultimately measured over a lifetime," and most researchers have to be content to "use short-term, proximate predictors of long-term behavior"

(Giles and Eyler 1994, 330). Much of the work in service-learning has taken place in the last five to ten years, which does not allow time for adequate evaluation. “Since service learning programs quite often do not produce a tangible outcome, evaluating the success of a particular program can be difficult” (pp. 47–48).

This study will add to the existing knowledge assessing the longer term benefits of environmental service-learning programs.

### **Current Practice and Approaches**

History, theory, and research inform the present-day practice of service-learning and environmental education. As both areas become more prevalent in schools, increased information and funds are available to study the components of effective programs around the country and the world. This section explains the current approaches and best practices in service-learning and environmental education.

### **Service-Learning**

“Service, combined with learning, adds value to each and transforms both” (Honnet & Poulsen, 1989). The connections between service-learning and school subjects and between students, their teachers, and the community are necessary components of a successful service-learning program. As Moras (1999) described,

Service-learning places curricular concepts from academic disciplines such as science, social studies, math, and language arts into a real-life context. It facilitates learners in analyzing, in evaluating, and in synthesizing concepts in their own terms through practical problem solving in response to real community needs. Service learning connects young people to other segments of the



community, promoting increased awareness of their environment. Supported by caring teachers and supervisors, students can face challenges and “accumulate experiences that strengthen academic studies” (ASLER 1993, 4). Classroom study is made more relevant and their presence in the world more valued when young people can connect their actions in the world beyond the school campus with their course work and developmental learning needs (p. 38).

Although service-learning is closely related to community service, Lankard (1995) articulated the difference between the two:

Service learning, community service, and volunteerism emphasize social responsibility and commitment to social concerns. They reflect responses to John F. Kennedy’s famous challenge to U.S. citizens: “Ask not what your country can do for you. Ask what you can do for your country.” Service learning, however, involves more than charity or doing for others. It is distinguishable from community service and volunteerism in that it requires a deliberate connection between service and academic learning and is accompanied by thoughtful reflection on the service experience. It moves the learner beyond activities of charity to include those of critical analysis (para. 2).

Organizations have deliberated at length to articulate the components of successful service-learning programs. The Johnson Foundation hosted a Wingspread Conference in 1989 to finalize the writing of ideas into terms that would be universally understood and widely applied (Moras, 1999). There were ten principles in their refined form, which culminated two years of work and the participation of 75 national and regional groups.

An effective and sustained program:

1. Engages people in responsible and challenging actions for the common good
2. Provides structured opportunities for people to reflect critically on their service experience
3. Articulates clear service and learning goals for everyone involved
4. Allows for those with needs to define those needs
5. Clarifies the responsibilities of each person and organization involved
6. Matches service providers and service needs through a process that recognizes changing circumstances
7. Expects genuine, active, and sustained organizational commitment
8. Includes training, supervision, monitoring, support, recognition, and evaluation to meet service and learning goals
9. Insures that the time commitment for service and learning is flexible, appropriate, and in the best interest of all involved
10. Is committed to program participation by and with diverse populations

(Moras, 1999, para. 18).

Many states have developed plans for service-learning. Maryland designed a set of guidelines for a successful service-learning program:

The Maryland School-Based Service-Learning Best Practices

1. Meet a recognized Need in the Community

Provide short-term assistance addressing a community need

Provide ongoing assistance addressing a community need

Work toward a lasting solution to a community problem

## 2. Achieve Curriculum Objectives Through Service-Learning

Incorporate service learning into a unit

Use service learning to unify the teaching of content and skills throughout the year

Teach content and/or skills in different disciplines using service learning throughout the year

## 3. Reflect Throughout Service-Learning Experience

At the end of the experience, students contemplate their service learning experience and receive responses

## 4. Develop Student Responsibility

Establish choices for students in how they implement the teacher-planned service learning

Share responsibility with students for service learning development and implementation

Facilitate student definition, coordination, and implementation of service learning

## 5. Establish Community Partnerships

Teachers consult with community partners for information and resources

Students interact with community partners

Students, teachers, and community partners collaborate as an action team

## 6. Plan Ahead for Service-Learning

Plan service learning independently

Collaborate with colleagues, students, and others to plan service learning

7. Equip Students with knowledge and skills needed for service

Equip students with knowledge and skills at the beginning of the experience

Equip students with knowledge and skills as needs arise or as the project changes. (used with permission of the Maryland Service Alliance) (Finney, 1997, p. 39).

The Minnesota Department of Education defined service-learning:

Service-learning is a form of experiential learning whereby students apply content knowledge, critical thinking and good judgment to address genuine community needs. Service-learning is a way of teaching and learning that engages all learners in hands-on academic projects in the community to meet learning objectives and strengthen communities. (Minnesota Department of Education, 2010, para. 1)

Minnesota is at the forefront of service-learning in the nation. In 2000, the Minnesota Committee to Advance Service-Learning convened and produced the Minnesota Service Learning Policy Brief.

### **Environmental Education**

The Leopold Education Project states that one of the goals of environmental education is to

create an ecologically literate citizenry, to heighten students' awareness of the natural world while fine-tuning the skills necessary to read the landscape, and to instill love, respect, and admiration for the land in order to create a personal land ethic in each individual. (p. 6)

Aldo Leopold (1949) believed it was important for people to develop a “land ethic.”

There is as yet, no ethics dealing with man’s relation to land and to the animals and plants which grow upon it. Land, like Odysseus’ slave girls, is still property. The land-relation is still strictly economic, entailing privileges but not obligations....

An ethic may be regarded as a mode of guidance for meeting ecological situations, so new or intricate or involving such deferred reactions, that the path of social expediency is not discernible to the average individual. Animal instincts are modes of guidance for the individual in meeting such situations. Ethics are possibly a kind of community in the making (p. 203).

Carlson, Jasper, and Otterson (1997) recognized some barriers to environmental education.

The passage of the 1990 Environmental Education Act supported and encouraged environmental education in schools, but the act was repealed in 1993. On a practical level, environmental education isn’t taking place to any great extent anyway. Common explanations for this situation appear in the literature (Ham and Sewing 1988; Simmons 1989; NCEET 1994). Some reasons include:

- teachers’ belief that environmental education is a component of science
- teachers’ lack of background and education in environmental education
- teachers’ lack of time or resources to teach environmental education
- negative attitudes toward science or environmental education (p. 9).

Carlson, Jasper, and Otterson (1997) believe that teachers need at the very least a working knowledge of concepts and interrelationships to guide the infusion of environmental education into curricula (Independent Commission on Environmental Education 1997; Orr 1994; Jaus 1978; Betherl and Hord 1982; Lane et al 1994; Ham, Rellergert-Taylor and Krumpel 1988; Hines et al 1987). A workshop conducted on strategies to reduce barriers to environmental education (Ham et al 1988) reported that 29.2% of workshop participants indicated on a pre-test they felt they had “an adequate background for conducting environmental education.” On the post-test, that percentage increased to 92% (p. 11).

Environmental education can make a difference. Marcinkowski & Mrazek (1991) reported that Jans in 1982 studied the effects of providing environmental education to elementary and middle school students and found that “through environmental education programs, student attitudes concerning the environment can be changed in a positive fashion” (p. 103).

Service-learning has many of the same barriers as environmental education. Proper teacher training, organizational leadership, lack of administrative support, time for planning, lack of funding, time out of the classroom, and the willingness to allow students to take ownership of their learning are roadblocks to the success of service-learning programs.

Initiatives for good service learning come from teachers who believe in connecting classrooms with the community for important learning (Shumer, 1993). Both school-based and community-based programs need strong leadership from individuals.... Effective, enduring programs also need strong administrative

support (Shumer, 1993)... It is vital that principals be engaged at every stage in the development of the service-learning program (Shumer, 1997, pp. 18–19).

### **Environmental Service-Learning**

Environmental service-learning combines the best practices of service-learning and environmental education. It uses the environment as the real-life context in which students learn, combining their knowledge obtained in the classroom environment with issues and environmental problems in their local area. Madigan (2000) contended

there are many characteristics that contribute to the good fit between service-learning and environment in youth/community partnerships. Haselkorn and De Grandi (1999) comment that environmental education and community service-learning helps students make connections between what they learn and how they live (p. 10).

Environmental service-learning programs, such as Eco Education, are becoming more prevalent in schools.

### **Summary**

Service-learning and environmental education programs are increasingly popular in K-12 schools across the country. Many states and organizations have spent a great deal of time and money researching the components of successful programs to assist teachers and schools to deliver the best possible programs. Schools benefit from the ongoing research in the field with the goal of implementing successful and effective programs. Many published guidelines are available and are necessary components in the delivery of the best possible program for students. Environmental education and service-learning guidelines and best practices complement each other well. Students take their

classroom knowledge and put it to work in a real-life context, helping to make their education relevant to their lives and to the health of the surrounding community.

Students, experiencing a well-planned and well-implemented program, are able to enhance their learning and contribute to the community in a meaningful way.



## CHAPTER III

### METHODOLOGY

The purpose of this study is to determine the views of high school students regarding their participation in a middle school environmental service-learning science curriculum facilitated by Eco Education and the influence of this program on solving community environmental issues, their own responsible environmental behaviors, or participation in future community environmental initiatives.

Students often reflect on service-learning experiences immediately following their project. This follow-up study includes interviews with high school students after the completion of their urban environmental service-learning experience in middle school. Few studies have followed up with students several years after their participation in a service-learning program. The studies that have attempted looking at the long-term effects of service-learning programs have come from higher education programs (Astin, Sax, & Avalos, 1999; Astin, Vogelgesang, Ikeda, & Yee, 2000; Chapin, 1998).

#### **Study Setting and Context**

Eco Education is a nonprofit organization based in Saint Paul, Minnesota, dedicated to working with middle school students and their teachers. Eco Education's staff assists with training teachers and facilitating the delivery of a science curriculum, Urban Stewards. Eco Education has served over 130,000 students since its inception. The program includes a science curriculum that culminates with a local environmental service-learning project in Minnesota. Students identify and choose a local issue, and they learn how to address the issue, attempting to solve, or at least to improve, the

identified issue in their community. Eco Education describes its mission and the history that led to the formation of the program:

Eco Education is a 501(c)(3) organization that is dedicated to fostering within young people the appreciation, knowledge, values, and skills necessary to inspire ecologically sound decisions and actions.

The organization was founded in 1991 to fill a need for environmental education for youth in Minnesota schools and other learning centers ... Eco Education focused its efforts to address the lack of urban-focused environmental education for inner-city young people.... Programs are geared primarily toward urban students and their teachers in an approach that engages urban youth through awareness and knowledge building that leads to participation and action in important environmental issues in their own neighborhoods (Eco Education, 2000, para. 1–2).

Eco Education's Urban Stewards program is aimed at the middle-grade level, targeting schools in Minneapolis and Saint Paul. The Urban Stewards program leads youth through a yearlong environmental learning process culminating in an environmental service-learning project. The program increases students' environmental problem-solving skills, expands the capacity for students and teachers to access community resources and develop partnerships, and support teachers in guiding students to carry out urban environmental improvement projects. Teams of teachers and their students from upper elementary and middle schools in Minneapolis and Saint Paul work with Eco Education staff to enhance the program.

Goals of Eco Education's program as described in *A Case Study: How is the Model Working?* are:

- To provide Student Relevance – Students need a chance to investigate and act upon a problem that is relevant to them in order to increase their motivation to learn.
- To Foster Youth as Citizens – Youth need to know that they can be forces of constructive change and that their involvement is needed in the community.
- To Provide Knowledge and Skills – Environmental education must go beyond knowledge to practice skills in community problem solving around environmental issues.
- To Provide Teacher Support – Educators who guide youth deserve the time, opportunity and support to practice new teaching methodologies, such as service-learning.
- To Use Community Resources –The school and its community contain an untapped abundance of rich resources for making education more meaningful to the students.

The Student Achievement Outcomes for Urban Stewards include the following:

- Students will develop more positive attitudes regarding their ability and willingness to address environmental issues.
- Students will learn an environmental education process for problem-solving.
- Students will become more active in addressing issues related to their environment (Wilder Foundation, 2001, pp. 24–25).

The Interdistrict Downtown School (IDDS) is a Minneapolis Public School and was the site for this project. The school's website describes the history and mission of the school.

The Minneapolis Public Schools and eight neighboring districts formed the West Metro Education Program (WMEP) in 1989. WMEP opened its first school, the Interdistrict Downtown School (IDDS), in 1998, and shortly thereafter expanded participation to include 10 districts. IDDS is a 500-student, K-12 school located in the heart of downtown Minneapolis. It is the result of unprecedented cooperation across district lines, imaginative educational conception, inventive curriculum planning and innovative architectural design.

The underlying philosophies of the school are multicultural learning, experiential learning, and technology as learning resources. The school reaches to the downtown community as a source of external labs, working with learning partners in the arts, government, business and other public and private sectors (IDDS, 2010, para. 3–4).

The school gave permission through the West Metro Education Program for this study and was chosen for its unique nature. One of the difficulties in finding students for this study was that once students left middle school, where the Eco Education program took place, they attended many different high schools. Often, the middle school teachers lost contact with them, making finding students difficult.

The Eco Education service-learning program at IDDS was titled Urban Stewards. The program was integrated into a general science curriculum for all students in eighth grade at IDDS. Science class met every day for 50 minutes. The Urban Stewards program

at IDDS provides teachers at IDDS and students in fifth through eighth grade classrooms with opportunities to identify and help solve environmental issues in their communities. The program is funded in part by the Legislative Commission on Minnesota Resources.

Throughout the school year, Eco Education staff members assist teachers in facilitating student groups as they create and implement environmental service-learning projects. Activities in the program incorporate the five goals of environmental education: awareness, knowledge, values, skills, and participation.

Students apply the environmental education process to their service projects. The process includes a community needs assessment, an issue investigation based on needs assessment results, an analysis of solutions, implementing a project with funding from Eco Education, and reflecting on accomplishments through journal writing and log books.

### **Research Questions**

This study focuses on surveying and interviewing 20 students. Ten students completed the Urban Stewards program facilitated by Eco Education. Ten students had a more traditional science experience in middle school. This study attempts to determine what, if any, perceived impact the Urban Stewards program had on students' views, actions, and future aspirations regarding the environment, as compared to those who had not had an Eco Education experience. The specific research questions are:

1. In what ways do students view participation in the Eco Education Urban Stewards program influences knowledge of community environmental issues?
2. In what ways are Eco Education students demonstrating environmentally responsible behaviors?

3. In what ways does Eco Education student participation in community environmental initiatives differ from students not participating in the Eco Education program?

### **Research Design**

Students at IDDS who received the Eco Education curriculum in eighth grade were interviewed and surveyed while they were in high school. These students had attended IDDS since elementary school. Students from the comparison group were students who came to IDDS in high school who had received a more traditional science curriculum that did not include the Eco Education curriculum. The IDDS eighth-grade science teacher confirmed that there were enough students still at IDDS to be able to interview at least 10 students. The science teacher suggested contacting the high school counselor to find students willing to be surveyed and interviewed. The high school counselor announced to the high school about the project, encouraged past middle school students and students new to the high school to participate in the study, and handed out permission forms to students willing to take part in the study. Of the 30 permission forms distributed, 25 came back. Ten Eco Education and 10 non-Eco Education students were randomly chosen to take part in the study. Each student received a \$10 stipend.

One week prior to the interview, students received the survey to complete and return. Student interviews took place in April and May 2008. The school counselor's office provided privacy during the interviews.

This mixed-methods study included surveys and follow-up interviews with students as the main focus of the research. Merriam (1998) maintains that

Qualitative researchers are interested in understanding the meaning people have constructed, that is, how they make sense of their world and the experiences they have in the world. Qualitative research “implies a direct concern with experience as it is ‘lived’ or ‘felt’ or ‘undergone’ (Sherman and Webb, 1988, p. 7).” (p. 6)

Merriam (1998) also believes that qualitative research finds meaning through people’s experiences, filtered through the researcher’s own viewpoint and perceptions, that the researcher is the “primary instrument for data collection and analysis” (p. 7), that it “usually involves fieldwork” (p. 7), that it “primarily employs an inductive research strategy” (p. 7), and that “since qualitative research focuses on process, meaning, and understanding, the product of a qualitative study is richly descriptive” (p. 8).

Qualitative studies are also known as postpositivist research. According to Gall, Borg, and Gall (1996),

Postpositivist research is grounded in the assumption that features of the social environment are constructed as interpretations by individuals and that these interpretations tend to be transitory and situational. Postpositivist researchers develop knowledge by collecting primarily verbal data through the intensive study of cases and then subjecting these data to analytic induction (p. 28).

Postpositivist research is more commonly known as qualitative research. According to Denzin and Lincoln (1994)

Qualitative research is multimethod in its focus, involving an interpretive, naturalistic approach to its subject matter. This means that qualitative researchers study things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them (pp. 28–29).

Gall, Borg, and Gall (1996) stated,

Another term that sometimes is used instead of qualitative research is case study research. This term emphasizes the fact that qualitative research focuses on the study of cases rather than of populations and samples. Some researchers believe that qualitative research is best used to discover themes and relationships at the case level, while quantitative research is best used to validate those themes and relationship in samples and populations. In this view, qualitative research plays a discovery role, while quantitative research plays a confirmatory role (p.29).

Gall, Gall, and Borg (1998) defined case study research as

the in-depth study of instances of a phenomenon in its natural context and from the perspective of the participants involved in the phenomenon.... A case study is done to shed light on a phenomenon, which is the processes, events, persons, or things of interest to the researcher. Examples of phenomena are programs, curricula, roles, and events (p. 545).

This study seeks to discover what, if any, lasting impact a middle school service-learning project had on its participants.

### **Sample Selection**

This study included 10 students who participated in Eco Education's Urban Stewards program in middle school and 10 students who did not participate in the program as a comparison group. Students were in high school at the time of the study. Students chosen for this study took part in the yearlong Urban Stewards environmental science program created and facilitated by Eco Education or in a standard middle school science program.



The study utilized network sampling, a form of purposeful sampling. Merriam (1998) pointed out that “as Patton (1990) says this strategy involves identifying participants or cases of interest from people who know people who know people who know what cases are information-rich” (p. 182). Teachers were asked for names of past students. School administrators were contacted and asked permission to send home a letter of introduction outlining the study’s purpose and importance (Appendix A). Parents were asked to fill out a permission form allowing their children to be surveyed and interviewed in person at their school, IDDS, during the school day. Students willing to participate received a modest remuneration for participating in a 30-45 minute interview and completing the Eco Education survey. The students were interviewed using the same set of questions.

### **Research Instruments**

Each interview was recorded and transcribed.

Of the three basic ways to record interview data, the most common by far is to tape record the interview. This practice ensures that everything said is preserved for analysis. The interviewer can also listen for ways to improve his or her questioning technique (Merriam, 1998, p. 87).

Data were analyzed in light of the research questions. The focus of the analysis was on the impact of the Eco Education program regarding the students’ current sense of empowerment toward environmental issues, their environmental behaviors, and their plans for the future. Merriam (1998) states,

the right way to analyze data in a qualitative study is to do it simultaneously with data collection. At the outset of a qualitative study, the investigator knows what

the problem is and has selected a sample to collect data in order to address the problem. But the researcher does not know what will be discovered, what or whom to concentrate on, or what the final analysis will be like. The final product is shaped by the data that are collected and the analysis that accompanies the entire process. Without ongoing analysis, the data can be unfocused, repetitious, and overwhelming in the sheer volume of material that needs to be processed. Data that have been analyzed while being collected are both parsimonious and illuminating (p. 162).

Transcriptions of the interviews were analyzed, looking for common themes and patterns. Categories were constructed, “that capture some recurring pattern that cuts across the preponderance” (Taylor & Bogdan, 1984, p. 139) of the data. These categories or themes are “concepts indicated by the data (and not the data itself)... In short, conceptual categories and properties have a life apart from the evidence that gave rise to them” (Glaser & Strauss, 1967, p. 36). “Devising categories is largely an intuitive process, but it is also systematic and informed by the study’s purpose, the investigator’s orientation and knowledge, and the meanings made explicit by the participants themselves” (Merriam, 1998, pp. 183–184). Typically, guidelines for category construction found in the literature are very general “and their applications are subject to the situational demands of a given study” (Merriam, 1998, p. 179). From these categories the researcher attempts to develop hypotheses and possible theories. Merriam (1998) described the process of data analysis as:

The development of categories, properties, and tentative hypotheses through the constant comparative method (Glaser and Strauss, 1967) is a process whereby the

data gradually evolve into a core of emerging theory. This core is a theoretical framework that guides the further collection of data. Deriving a theory from the data involves both the integration and the refinement of categories properties, and hypotheses (p. 191).

### **Method of Data Collection**

Semistructured oral interviews and surveys were conducted with each student, and the interviews were recorded. In a semistructured interview, there is flexibility in the wording and order of the questions. Merriam (1998) states,

usually, specific information is desired from all the respondents, in which case there is a highly structured section to the interview. But the largest part of the interview is guided by a list of questions or issues to be explored, and neither the exact wording nor the order of the questions is determined ahead of time. This format allows the researcher to respond to the situation at hand, to the emerging world view of the respondent, and to new ideas on the topic (p. 74).

Merriam (1998) contends that “qualitative data consist of ‘direct quotations from people about their experiences, opinions, feelings, and knowledge’ obtained through interviews; ‘detailed descriptions of people’s activities, behaviors, actions’ recorded in observations; and ‘excerpts, quotations, or entire passages; extracted from various types of documents’” (p. 69). Merriam (1998) also includes Patton’s explanation of the need for interviews:

We interview people to find out from them those things we cannot directly observe.... We cannot observe feelings, thoughts, and intentions. We cannot observe behaviors that took place at some previous point in time. We cannot

observe situations that preclude the presence of an observer. We cannot observe how people have organized the world and the meanings they attach to what goes on in the world. We have to ask people questions about those things. The purpose of interviewing, then, is to allow us to enter into the other person's perspective (p. 70).

Various methods and incentives were used to track down students to be interviewed. With the assistance of the Eco Education staff, teachers of the Model Schools program were contacted to gather names of students who went through the program and their current school information. Teachers who used the Eco Education program were contacted to assist in finding students who had taken part in the program since its inception. Students were then asked to supply further names of past students from their class.

A series of questions were asked of each student during the interview, with the conversations being recorded (see Appendix B for a list of questions asked). Surveys were administered to students and results were tallied. Observations and data gained in the field were analyzed and evaluated, attempting to build theories from the findings.

Comparing Eco Education students to non-Eco Education students through the survey, two points were added for each *strongly agree* answer and one point for each *somewhat agree* answer, and one point was deducted for each *somewhat disagree* answer and two points for each *strongly disagree* answer. This way, at a glance, one can see differences between Eco Education and non-Eco Education student responses. Results were tabulated and recorded in chart form.

## CHAPTER IV

### RESULTS

Students at the Interdistrict Downtown School (IDDS) took part in Urban Stewards, a yearlong curriculum designed and facilitated by Eco Education. Many students arrive at IDDS for high school having experienced a more traditional science education curriculum in other schools. For the purposes of this study, Twenty students completed an Environmental Education Survey and were interviewed at IDDS in the spring of 2008. Ten students had received the Eco Education Urban Stewards curriculum at the IDDS in eighth grade, and the other 10 had regular science education in different middle schools that did not include the Eco Education curriculum. Students were currently in high school at the time of the survey and interview.

The results of the survey were collated, tallied, compared, and analyzed. The interviews were recorded, transcribed, and used to compare and contrast the results of the survey. The survey results and interviews were analyzed through the lens of the purpose statement and the three research questions.

### **Results**

#### **Statement of Purpose**

The purpose of the study is to determine student views of the Eco Education Urban Stewards program's impact on student involvement in community environmental initiatives.

1. In what ways do students view participation in the Eco Education Urban Stewards program influences knowledge of community environmental issues?

2. In what ways are Eco Education students demonstrating environmentally responsible behaviors?
3. In what ways does Eco Education student participation in community environmental initiatives differ from students not participating in the Eco Education program?

### **Results for Research Question 1**

*In what ways do students view participation in the Eco Education Urban Stewards program influences knowledge of community environmental issues?*

During the interviews, students who had taken part in Urban Stewards could name a much greater number of environmentally related issues, such as their own personal actions and general community environmental issues. These students were adamant that they had learned a great deal from the Urban Stewards program. One student stated, “[Urban Stewards] made me really aware about everything.... It changed my life a lot with almost everything.” Another Eco Education student felt strongly influenced by the Urban Stewards program: “[Urban Stewards] made me more aware of what I was doing. Some certain things I changed up, like we started recycling, which I didn’t do before. I just didn’t care. But now my mom recycles, my dad, my grandma.” Reflecting on the Eco Education experience in the interview, another student said, “I can honestly say that before Urban Stewards I wasn’t big on recycling at all. I thought everything was trash, so once you get done drinking it you can throw it away. So that helped me, you know, put the can in the recycling bin. Stuff like that. Recycle paper, that’s what I learned.”

I do think I will be more aware in regards to environmental issues because I didn’t know too much about it, and once you start knowing about it you start thinking

about the effects and the long-term effects of what it's going to have, so I think it does make you a lot more open-minded to those types of things.

As another stated, "It makes you think about the little things that'll actually help in the long run."

In the survey, when thinking ahead to the future, six of ten students stated that Urban Stewards would make them think differently about their purchases and choices. This is supported in the interviews with comments such as: "We were thinking of getting some solar panels that we could put on our roof" or "I won't buy a Hummer or anything like that. I will get a hybrid car." Another student looked to the future as an adult: "I'd be going to schools, talking about it, helping other kids, doing projects so that they can become aware of environmental issues." Another stated in the interview how awareness has impacted personal thinking: "Yeah, like if I had never [had Urban Stewards] ... I never would have known about global warming, just thought it was a big word." Many students expressed ongoing interest, such as one who said, "I want to get more active" and another who stated,

I really want to still stay active in that [environmental issues], and I want to go into education. But I also want to make sure that, like in education you can start kids when they're young, about things like that: recycling, about the environment, about how throwing something on the ground could kill off this and can make our air a lot worse and just different things like that. I'm going into education and that's going to be a big part of what I want to do.

Urban Stewards, in this student's mind, could greatly impact future career choices.

Reflecting on the experience, one student stated,

I learned to make the community look nicer, and if you help out with the community and do your part ... I hope at least people can stop littering. If I see people litter I could say "pick it up" or I could say "there's a trash bin right there."

There is a sense of strong advocacy for the environment and the student's own ability to make a difference in the interviews: "I'll probably start going to protests" and "Yeah, because then when I see other people I can inform them because I know, because I have learned stuff now." Another student stated, "Urban Stewards made me more aware of how little things could add up."

In order to quantify the results of the written survey, a point system was utilized. This system allotted two points for every *strongly agree* and one point for every *somewhat agree* and subtracted one point for every *somewhat disagree* and two points for every *strongly disagree*. Utilizing this method makes it possible to distinguish the differences at a glance which can be found in Table 1. All ten Eco Education students surveyed agreed with the statement "It is important for me to help improve my school and neighborhood" (seven strongly agree) as seen in Table 2, leading to the largest difference in the survey results in Table 1. All ten Eco Education students agreed with the question "I can solve problems in my school and neighborhood." However, so did nine of the non-Eco Education students as seen in Table 2. Nine of the ten Eco Education students agreed with the statement "I know what I need to do to plan an environmental improvement project from beginning to end," indicating not only the knowledge of community environmental issues but also the importance of it and the students' ability to address the issues.



Table 1

*Eco Education Survey Results*

Eco Ed Students	Non-Eco Ed Students	Survey Questions
Total Points	Total Points	
18	16	It is important for me to help improve my school and neighborhood
18	13	I can help to solve problems in my school and neighborhood
12	12	I know what I need to do to plan a project from beginning to end
17	11	It is important for me to help improve my school and neighborhood
13	12	I can solve problems in my school and neighborhood
10	9	I know what I need to do to plan an environmental improvement project from beginning to end
6 hours	8 hours	I spend ___ hours each week volunteering or helping at school or in the neighborhood
13	10	I speak up about my own ideas and concerns for the environment in a group of people
12	15	I talk with others about environmental problems and issues
3	3	I know resources to contact in the community to gain the information I need to address environmental issues
14	12	I personally take part in recycling efforts
13	14	I do not litter and encourage others not to litter
10	7	I try to conserve energy
15	11	I have actively participated in efforts to improve the environment
5	-1	I base some of my purchases on environmental considerations
15	15	Environmental concerns will have an impact on my decision-making as an adult (e.g., cars, energy efficiency)
14	12	I hope to play an active role in improving the environment as an adult.

*Note.* Add 2 points for *strongly agree*. Add 1 point for *somewhat agree*. Subtract 1 point for *somewhat disagree*. Subtract 2 points for *strongly disagree*.

Table 2

*Environmental Education Survey Comparison*

Black = Eco Education Students

*Italics* = Non-Eco Education Students**Bold** = Likert Scale

1. It is important for me to help improve my school and neighborhood.

Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
8, 6	2, 4		

2. I can help to solve problems in my school and neighborhood.

Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
5, 3	5, 7		

3. I know what I need to do to plan a project from beginning to end.

Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
2, 4	8, 5	<i>1</i>	

4. It is important for me to help improve my school and neighborhood.

Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
7, 3	3, 6	<i>1</i>	

5. I can solve problems in my school and neighborhood.

Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
3, 4	7, 5	<i>1</i>	

6. I know what I need to do to plan an environmental improvement project from beginning to end.

Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
2, 3	7, 5	1, 2	

7. I spend \_\_\_\_\_ hours each week volunteering or helping at school or in the neighborhood.

8. I speak up about my own ideas and concerns for the environment in a group of people.

Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
3, 3	7, 6		1

9. I talk with others about environmental problems and issues.

Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
4, 5	5, 5	1	

10. I know resources to contact in the community to gain the information I need to address environmental issues.

Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
1, 1	5, 5	4, 4	

11. I personally take part in recycling efforts.

Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
6, 4	3, 5	1, 1	

12. I do not litter and encourage others not to litter.

Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
6, 4	3, 6		1

13. I try to conserve energy.

Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
2, 5	7, 1	1, 4	

14. I have actively participated in efforts to improve the environment.

Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
5, 3	5, 6	1	

15. I base some of my purchases on environmental considerations.

Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
3, 1	3, 3	4, 6	

16. Environmental concerns will have an impact on my decision-making as an adult (e.g., cars, energy efficiency, organic growing).

Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
5, 5	5, 5		

17. I hope to play an active role in improving the environment as an adult.

Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
4, 2	6, 8		

In the words of one student during the interview, “It was real fun. I learned a lot from it.” Another, who was passionate about the experience and a personal ability to make a difference with environmental issues, said,

I think we can be the voices. We’re the next generation. We should be the ones who care most about it ’cause we can get more people interested in it. If we get more people interested in it then maybe in the next generation we won’t have problems.

Non-Eco Education students often could not readily identify environmental community issues. One asked for an example before giving the answer in the interview, and others could name only one or two examples. Two students responded with “no” when asked in the interview if they could name an environmental community issue, and yet another said, “not with strong detail” in response to the question.

## **Results for Research Question 2**

*In what ways are Eco Education students demonstrating environmentally responsible behaviors?*

Students who took part in the Eco Education Urban Stewards program were articulate and specific about their environmentally responsible behaviors. One student stated in the interview, “[Urban Stewards] made me really aware about everything.... It changed my life a lot with almost everything.” The most common environmentally responsible behaviors included recycling, not littering, and saving energy. Many spoke about using public transportation or energy-efficient means of transportation, using energy-efficient light bulbs, and reducing water use. Turning off televisions and computers when not in use was also mentioned.

Many students spoke in the interviews about letting others know what they had learned about global warming during the Urban Stewards program and being strong advocates for the environment. Many went on to tell others about what they learned (especially their own families): “I think I would get involved in programs and stuff and spread the word.” One student was inspired to

start my own organization or program for adults and children to just come once in a while and get the facts about global warming and things that they can do to help reduce global warming.... Basically what I want to do—I don’t care how I do it, I just want to get it out there—I want everybody to know about global warming and what they can do to reduce it. I just want to get it out there. I want everybody to know about it.

Nine out of ten Eco Education students completing the survey agreed with the statement “I personally take part in recycling efforts,” but only six non-Eco Education students agreed with the statement (Table 2). For the survey question “I do not litter and encourage others not to litter,” six of ten Eco Education students strongly agreed with the statement. All 10 Eco Education students agreed with the statement “I have actively participated in efforts to improve the environment.” Six of ten Eco Education students indicated that they base some of their purchases on environmental considerations (Table 2).

Non-Eco Education students did not know or did not acknowledge actions taken to benefit the environment since attending middle school. Some students answered “no” and others said “I don’t think so.” They named fewer different types of actions, with recycling being the most frequent. Most non-Eco Education students (six) disagreed with

the statement “I base some of my purchases on environmental considerations,” whereas six Eco Education students agreed with that statement (Table 2).

### **Results of Research Question 3**

*In what ways does Eco Education student participation in community environmental initiatives differ from students not participating in the Eco Education program?*

Overall, there was not a great difference in the survey results between students who had taken part in the Urban Stewards program and those who had not regarding this research question. Almost all students either strongly agreed or somewhat agreed with the first six survey questions regarding this research question (Table 2). Students who participated in the Urban Stewards program had more *strongly agree* answers, indicating an influence by the Urban Stewards program as to the strength of their convictions. For example, eight Eco Education students strongly agreed with the statement “I can help to solve problems in my school and neighborhood,” as compared to six students who participated in a traditional science program.

Question 4 in the survey, “It is important for me to help improve my school and neighborhood,” had more Eco Education students strongly agree. The Eco Education survey results (Table 1) shows a difference of 6 points, with Eco Education students giving the statement more emphasis than non-Eco Education students. Seven Eco Education students strongly agree to question 4, compared to only three non-Eco Education students.

In terms of conserving energy, nine out of 10 Eco Education students agreed that they try to conserve energy, compared to six out of 10 non-Eco Education students.

When asked in the survey if environmental considerations influenced purchases they made, six out of ten Eco Education students agreed with the statement, as opposed to only four non-Eco Education students. Answering the question of whether their middle school science experience would make them more aware and active regarding environmental issues as an adult, all Eco Education students in the interviews said “yes,” whereas one non-Eco Education student said “no” and another said “I am not sure.”

Eco Education students were also able to name a wider variety of community environmental issues during the interviews. Each Eco Education student mentioned at least one community environmental issue, and many had multiple examples. When non-Eco Education students were asked for environmental community issues, most could only give one example, and three students could not name any, giving answers such as “not with strong detail” or a simple “no,” or asking the interviewer in return “umm, could you give me an example, please.”

One of the biggest differences was the passion with which Eco Education students spoke about their ability to have a positive influence on the future of the environment despite their young age.

Well, some kids think just because you're younger that some adults won't think too much about it—like he's young, he doesn't know what he's talking about. But if you stress that point enough, they will get it into their heads, and all you got to do if you do anything to tell anyone about global warming, you don't even have to have the right resources, you can just go off with your community and it spreads on. You tell your community, that community tells that community, that community tells that community, and everyone knows about what you did. It's



easy because everybody gets, like, so you can do the smallest thing and it can grow into the biggest thing to ever happen.

Or another who states in the interview,

I think we can be the voices. We're the next generation. We should be the ones who care most about it 'cause we can get more people interested in it. If we get more people interested in it, then maybe in the next generation we won't have problems.

### **Conclusion**

Students viewed Eco Education's yearlong Urban Stewards program as more positively influencing their ability to identify and address community environmental issues than students who had a more traditional science experience in middle school. The completion of a neighborhood community project solidified much of the knowledge gained in the classroom. Whether it was picking up litter, educating the community, or collaborating with peers and community members, Eco Education students demonstrated more concern for, and willingness to advocate for change than non-Eco Education students.

Eco Education students identified a greater number of personal actions in which they were currently active and demonstrated a greater desire to share environmental information with others than their other classmates. Non-Eco Education students indicated participation in fewer and more common environmentally responsible behaviors, such as recycling, not littering, and limiting water use. Eco Education students spoke more about the effects of global warming and the need to tell more people about it and encourage more people to develop environmentally responsible behaviors,

such as lessening the amount of carbon dioxide emissions by using public transportation or buying fuel-efficient or hybrid automobiles.

While the survey results did not demonstrate a large difference between the two groups of students, small differences showed that Eco Education students were more aware of, and active in environmental community issues. Responses of Eco Education students to the interview questions demonstrated a greater depth of knowledge and more of a desire to advocate for change.

## CHAPTER V

### DISCUSSION

Urban Stewards is a full-year curriculum designed and facilitated by Eco Education, a nonprofit organization in Saint Paul, Minnesota. Eco Education works with middle school students throughout the Twin Cities area. Although anecdotally Eco Education's staff believes the curriculum makes a difference in the lives of students, no long-term evaluation had previously been conducted. This study identified students who had experienced the Eco Education curriculum and compared their responses on interviews and surveys with those of students from the same school who had not participated in the Eco Education experience.

#### **Summary of Purpose**

The purpose of the study is to compare the influence of participation in Eco Education's Urban Stewards program to nonparticipation in the program regarding solving environmental issues, environmentally responsible behaviors, and aspirations for future environmental actions. This follow-up study interviewed students three years after the completion of their Urban Stewards environmental service-learning experience. This study set out to discover what difference, if any, Eco Education's Urban Stewards program had on students' solving environmental issues, environmentally responsible behaviors, and aspirations for future environmental actions.

#### **Significance and Rationale of the Study**

There are very few studies that track students years after the conclusion of a program. It is difficult to keep track of students many years after their service-learning experience, hence there is a shortage of longitudinal studies. In the introduction to

*Studying Service-Learning: Innovation in Education Research Methodology*, Billig maintained that “currently, too few studies ... are longitudinal in nature” (Billig & Waterman, 2003, p. ix). Howard (2003) states

Furthermore, researchers know a fair amount about the effects of service-learning on students during their period of participation, but much less about the long-term impacts of participation. Do students become lifelong civic participants as a result of their involvement in service-learning? How else are they influenced over the long run? (p. 8).

Furco (2003) contends that “service-learning studies should investigate outcomes and impacts in a more longitudinal vein whereby the long-term impacts of service-learning are investigated” (p. 20).

### **Review of Procedures**

The Interdistrict Downtown School was the site of this research project. With the help of individual science teachers and the school counselor, students who had taken part in the Eco Education program were identified, and an equal number of students who had not experienced the program were chosen randomly.

Each student completed a survey, and the surveys were tallied. Each student was also interviewed. Interviews were recorded and transcribed for further study. Students received a \$10 stipend for their participation in the study.

The results were analyzed to look for differences between the students who had taken part in Eco Education’s Urban Stewards program and those who had not received that specific curriculum.

### Review of Main Findings

There was little difference between groups on many of the survey questions. Much of this could be attributed to the pervasiveness of news about the environment in the media. From Al Gore's *An Inconvenient Truth* to news about the disappearing polar bears, spotted owls, and so on, students are inundated with the message that the planet is slowly deteriorating. Students have heard "Reduce, Reuse, Recycle" since elementary school. The age-old mantras to turn out the lights to conserve energy, ride a bike or walk to save energy, and stay away from gas-guzzling cars are all messages that children and adults hear repeatedly from month to month. Some of these messages touch every student and may be reflected in the non-Eco Education students knowing about and caring for the environment.

Results for research question 1, "In what ways do students view participation in the Eco Education Urban Stewards program influences knowledge of community environmental issues?" demonstrated that students who experienced the Eco Education program knew more and a wider variety of community environmental issues. Many non-Eco Education students were not able to name a single community environmental issue, while all Eco Education students were able to do so.

With a difference of +5 points, question 2, "I can help to solve problems in my school and neighborhood," demonstrated a difference. One of the Urban Stewards program's most powerful messages is empowering students and helping them realize that they can make a difference as young people and do not have to wait until they are grown up to act. In the words of one student,

Well, some kids think just because you're younger that some adults won't think too much about it—like, he's young, he doesn't know what he's talking about. But if you stress that point enough, they will get it into their heads, and all you got to do if you do anything to tell anyone about global warming, you don't even have to have the right resources, you can just go off with your community and it spreads on. You tell your community, that community tells that community, that community tells that community, and everyone knows about what you did. It's easy because everybody gets, like, so you can do the smallest thing and it can grow into the biggest thing to ever happen.

Another student likewise stated,

Awareness really counts towards it, so when you have more people aware, and you know kids now are the next generation, so when we're adults we'll know more about it and we'll know more ways of how to stop global warming. So I think it is very possible for kids to change it and have an impact, and I think it works really good when the kid starts young.

Middle school students learned through Eco Education that they have the capability of identifying environmental issues and of creating and implementing plans to address them. This empowerment is one of the most important impacts on students inspired by the Urban Stewards program.

Findings for research question 2, "In what ways are Eco Education students demonstrating environmentally responsible behaviors?" indicate that Eco Education students were not only more articulate regarding environmentally responsible behaviors but also took part in a wider variety of them.

A question with a substantial difference (+6 points) was “I base some of my purchases on environmental considerations.” This response indicates realization that each person’s individual choices have an overall impact on the environment. It demonstrates a thoughtfulness and awareness of environmental issues and the actions and circumstances that negatively affect the environment. Urban Stewards encourages students to think about the consequences of their decisions and the impact of those decisions on the environment. They learn that choices can make a difference; as one student stated, “It makes you think about the little things that’ll actually help in the long run.”

When comparing student answers to the survey within the framework of the three research questions, the greatest difference was in the current environmentally responsible behaviors category, indicating a strong impact of the program on students’ actions. Although only one question in this category appeared significant, when looking at the entire category, it was evident that Urban Stewards had an impact on students’ current practices. One student discusses the impact of the program by saying:

I do think I will be more aware in regards to environmental issues because I didn’t know too much about it, and once you start knowing about it you start thinking about the effects and the long-term effects of what it’s going to have, so I think it does make you a lot more open-minded to those types of things.

There was a substantial overall difference (+28 points) between the two groups, which demonstrated that Urban Stewards did have a positive overall impact on the students’ understanding about and attitude toward the environment. The biggest overall positive difference (+6 points) occurred on two questions. The first question was “It is

important for me to help improve my school and neighborhood.” Through the Urban Stewards program, students had the opportunity to explore possible neighborhood environmental issues, choose one to explore in-depth, and chart a plan to address the issue. This opportunity brought to light the importance of local community issues regarding the environment and their ability to assess and address these issues. Students learned that it is indeed possible to improve the environment in the school and neighborhood if one takes the time, makes the effort, and has the knowledge. In the words of one student, “I think if they put their mind to it we [students] can do anything, and sometimes we can do things better than adults can.” Another was quoted as saying, “If we all work together, we can make something happen.”

Responses to research question 3, “In what ways does Eco Education student participation in community environmental initiatives differ from students not participating in the Eco Education program?” showed that students who took part in the Eco Education program knew what community environmental initiatives were, and had taken part in these initiatives. Non-Eco Education students, on the other hand, had difficulty knowing what community environmental initiatives were and had very limited experience participating in community environmental initiatives.

Students who took part in Eco Education had a strong sense of service being important, which demonstrated a greater feeling of empowerment among students who participated in the Urban Stewards program. This is an important area of program impact. One student stated,

We learned a lot about global warming 'cause at the same time we were also writing about a global warming paper, so we had to do that for English. So I



learned a lot about global warming and I learned, I just learned that, I don't know, that it was easier than we thought that we could help.

Learning that they can make a difference, students have the potential to make a lifelong effort to improve the environment. In the words of one student, "If we all work together, we can make something happen." By beginning at an early age, there are more opportunities to act and learn, leading to greater lifelong involvement and making a more significant impact.

### **Conclusion**

The environment is one of the most important issues facing future generations. Urban Stewards gives students the knowledge and skills to begin addressing local, urban environmental issues. Students are given the opportunity to learn that they are capable of making a difference and that it matters. When considering whether or not to adopt the Urban Stewards program, these positive outcomes should be considered. Students learn:

- their individual actions impact the environment
- they can educate others about environmental issues
- they can make a difference
- they have the skills and knowledge to carry out their own plan to improve the environment

Students gain specific knowledge about the environment with a focus on the local, urban environment. Their service-learning projects also highlight the connection between what they learn in class and the real world.

Although there is not definitive data to show the extent of the program's impact, there is evidence that it raised awareness and taught advocacy skills for the environment,

when compared with students who were not exposed to the Urban Stewards curriculum. By being exposed to the content and connecting that content to a real-world situation, students gained the skills and knowledge to plan and implement a program to the benefit of the local community environment. This knowledge impacted their beliefs, personal actions, and attitudes toward the environment and service-related activities for the environment. By reaching students at the critical juncture in their lives between childhood and adulthood, Urban Stewards exposed students to the notion of making a difference for the remainder of their lives. With this knowledge, they are more likely to continue conserving energy, to be active in the fight against global warming, and not to be intimidated by the prospect of using their knowledge to organize efforts to improve the environment. This program has the potential to have a positive effect on the environment far beyond high school. Although not quantifiable, this effect can be assumed given the individual quotes from students. For example, one student said, “[Urban Stewards] made me really aware about everything.... It changed my life a lot with almost everything.”

Another student stated,

Basically what I want to do—I don’t care how I do it, I just want to get it out there—I want everybody to know about global warming and what they can do to reduce it. I just want to get it out there. I want every body to know about it.

The Urban Stewards program had a positive impact on this student and others in the program. Urban Stewards students were passionate and knowledgeable about environmental issues and were willing to advocate for change and to work to improve the environment.

### **Limitations of the Study**

This case study describes the experiences of 10 students in Eco Education's Urban Stewards Program and their current beliefs, actions, and values toward the environment. These findings cannot be extended to the general population. Many other factors may have contributed to the opinions, beliefs, and actions of the students. These may include the impact of parents' beliefs, views, and support, experience outside of school with nature and the environment, and personal interest in the subject. Current behavior, thoughts, and beliefs are described but may not necessarily be explained solely by participation in the program.

Another limitation stems from the qualitative nature of the study, relying on interviews and surveys. Students may give answers that a "teacher" wishes to hear or that they believe are the "right" answers, not necessarily the honest answers. They may wish to appear more active and passionate about the environment than they are in reality. They may wish to please their past teachers rather than hurt their feelings and so say what they think should be said. This study does not take into account the specific curriculum of the regular science class and what emphasis was placed on environmental education, instead using only the students' perspectives to remember the content.

The researcher believes in the benefits and importance of environmental service-learning. This may impact the interviews and analysis of the data, despite the researcher's best intentions to remain neutral. This bias may be a limitation of this study.

## **Recommendations**

This study was limited in its scope. It is extremely difficult to find students years after taking part in a particular program. To be able to get broader participation, a researcher or the Eco Education organization could ask for permission from a full year's contingent of students by asking for their contact information and permission to contact them in five years. This would facilitate contacting students even if they change schools during the course of their education. This would allow a much larger sample size from which to draw information.

It is also recommended to expand the research to other environmental service-learning programs to compare results over time. The differences in delivery of the curriculum and the venues would need to be taken into account.

Since the completion of this study, the National Youth Leadership Council has devised research-based K-12 service-learning standards for quality practice. Future research in the field should utilize these standards to study the effectiveness of service-learning projects. The standards identified by the National Youth Leadership Council include

- 1) Service-learning actively engages participants in meaningful and personally relevant service activities.
- 2) Service-learning is intentionally used as an instructional strategy to meet learning goals and/or content standards.
- 3) Service-learning incorporates multiple challenging reflection activities that are ongoing and that prompt deep thinking and analysis about oneself and one's relationship to society.

- 4) Service-learning promotes understanding of diversity and mutual respect among all participants.
- 5) Service-learning provides youth with a strong voice in planning, implementing, and evaluating service-learning experiences with guidance from adults.
- 6) Service-learning partnerships are collaborative and mutually beneficial, and address community needs.
- 7) Service learning engages participants in an ongoing process to assess the quality of implementation and progress toward meeting specified goals, and uses results for improvement and sustainability.
- 8) Service-learning has sufficient duration and intensity to address community needs and meet specified outcomes (NYLC, 2009, para. 1).

With these standards as a foundation, combined with the best practices of the environmental and experiential education, students receive a powerful combination of classroom instruction and hands-on experience with real environmental conservation challenges. In addition they experience the satisfaction of serving or contributing to their community. Environmental service-learning has a powerful impact on student learning. As the importance of environmental concerns increases worldwide, the need increases to give students the knowledge, skills and attitudes to confront the environmental issues of their generation. In conjunction with the instillation of a sense of responsibility for the environment, environmental service-learning equips the next generation with the necessary tools to collaborate and problem-solve the upcoming issues in the global community.

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Appendix: A

**Letter**

January, 2007

Dear Interdistrict Downtown School Student,

You are invited to take part in a research project I am conducting as a graduate student at the University of Minnesota. The project involves environmental education and environmental service-learning in particular. You may or may not have taken part in a curriculum designed by a non-profit group in St. Paul known as Eco Education during your middle school years. I will be interviewing both students who took part in the program and others who have not. Questions about your attitudes, knowledge, practice and aspirations about the environment will be asked.

The process should take no longer than 45 minutes and can be completed before or right after school or during a free period at school. You would first fill out a short, written survey and then take part in a one-on-one interview with me as a follow-up to the survey. All responses will remain confidential.

As a sign of my appreciation for your time, I would like to give you \$10 for taking part in this study. If you are willing to take part in this research project, I would be very grateful. The next step would be to get a consent form from Ms Macauley to be signed by you and a parent and returned as soon as possible.

Please let me know if you have any further questions.

Sincerely,

Tom Hobert

thomashobert@yahoo.com

## Appendix B

### Interview Questions for Non-Eco Education Students

#### Research Question 1

- Tell me what you learned about the environment and environmental issues during middle school science classes.
- Are you aware of environmental community issues? What are they?
- Do you think it is possible for students to make a difference on an environmental issue? Why or why not?

#### Research Question 2

- Has your science education during middle school had an impact in regard to your own personal environmentally responsible habits?
- What current personal actions would you describe as environmentally responsible? (Recycling, water wastage, littering, etc.)
- Since middle school, what actions have you taken to the benefit of the environment?

#### Research Question 3

- What are your personal hopes for the future in regards to the environment?
- What actions might you take as an adult demonstrating environmental responsibility?
- As a result of your middle school science experience, do you think you will be more aware and active in regards to environmental issues as an adult? Explain.



## **Interview Questions for Eco Education Participants**

### **Research Question 1**

- Tell me about the Eco Education final service-learning project in which you took part.
- What did you learn?
- How has it made you more aware of community issues? Can you name some issues?
- Do you think it is possible for kids to make a difference on an environmental issue? Why or why not?

### **Research Question 2**

- How did the Urban Stewards program affect your thoughts and actions in regard to your own personal environmentally responsible habits?
- What current personal actions would you describe as environmentally responsible? (Recycling, water wastage, littering, etc.)

### **Research Question 3**

- What are your personal hopes for the future in regards to the environment?
- What actions might you take as an adult demonstrating an awareness of environmental responsibility?
- As a result of your Eco Education experience, do you think you will be more aware and active in regards to environmental issues as an adult? Explain.

## Appendix C

**Environmental Education Survey****Views of Impact**

1) It is important for me to help improve my school and neighborhood.

Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
1	2	3	4

2) I can help to solve problems in my school and neighborhood.

Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
1	2	3	4

3) I know what I need to do to plan a project from beginning to end.

Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
1	2	3	4

4) It is important for me to help improve my school and neighborhood.

Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
1	2	3	4

5) I can solve problems in my school and neighborhood.

Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
1	2	3	4

6) I know what I need to do to plan an environmental improvement project from beginning to end.

Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
1	2	3	4

7) I spend \_\_\_\_\_ hours each week volunteering or helping at school or in the neighborhood.

8) I speak up about my own ideas and concerns for the environment in a group of people.

Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
1	2	3	4

9) I talk with others about environmental problems and issues.

Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
1	2	3	4

10) I know resources to contact in the community to gain the information I need to address environmental issues.

Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
1	2	3	4

### **Environmentally Responsible Behaviors**

11) I personally take part in recycling efforts.

Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
1	2	3	4

12) I do not litter and encourage others not to litter.

Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
1	2	3	4

13) I try to conserve energy.

Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
1	2	3	4

14) I have actively participated in efforts to improve the environment.

Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
1	2	3	4

15) I base some of my purchases on environmental considerations.

Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
1	2	3	4

### **Aspirations**

16) Environmental concerns will have an impact on my decision-making as an adult. ie. Cars, energy efficiency, organic growing ...

Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
1	2	3	4

17) I hope to play an active role in improving the environment as an adult.

Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
1	2	3	4

Appendix D  
Survey

Table D1

*Eco Education Survey Results*

Eco Ed Students	Non-Eco Ed Students	Survey Questions
Total Points	Total Points	
18	16	It is important for me to help improve my school and neighborhood
18	13	I can help to solve problems in my school and neighborhood
12	12	I know what I need to do to plan a project from beginning to end
17	11	It is important for me to help improve my school and neighborhood
13	12	I can solve problems in my school and neighborhood
10	9	I know what I need to do to plan an environmental improvement project from beginning to end
6 hours	8 hours	I spend ___ hours each week volunteering or helping at school or in the neighborhood
13	10	I speak up about my own ideas and concerns for the environment in a group of people
12	15	I talk with others about environmental problems and issues
3	3	I know resources to contact in the community to gain the information I need to address environmental issues
14	12	I personally take part in recycling efforts
13	14	I do not litter and encourage others not to litter
10	7	I try to conserve energy
15	11	I have actively participated in efforts to improve the environment
5	-1	I base some of my purchases on environmental considerations
15	15	Environmental concerns will have an impact on my decision-making as an adult (e.g., cars, energy efficiency)
14	12	I hope to play an active role in improving the environment as an adult.

*Note.* Add 2 points for *strongly agree*. Add 1 point for *somewhat agree*. Subtract 1 point for *somewhat disagree*. Subtract 2 points for *strongly disagree*.

Table D2

*Environmental Education Survey Comparison*

Black = Eco Education Students

*Italics* = Non-Eco Education Students**Bold** = Likert Scale

1. It is important for me to help improve my school and neighborhood.

Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
8, 6	2, 4		

2. I can help to solve problems in my school and neighborhood.

Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
5, 3	5, 7		

3. I know what I need to do to plan a project from beginning to end.

Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
2, 4	8, 5	<i>1</i>	

4. It is important for me to help improve my school and neighborhood.

Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
7, 3	3, 6	<i>1</i>	

5. I can solve problems in my school and neighborhood.

Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
3, 4	7, 5	<i>1</i>	

6. I know what I need to do to plan an environmental improvement project from beginning to end.

Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
2, 3	7, 5	1, 2	

7. I spend \_\_\_\_\_ hours each week volunteering or helping at school or in the neighborhood.

8. I speak up about my own ideas and concerns for the environment in a group of people.

Strongly	Somewhat	Somewhat	Strongly
Agree	Agree	Disagree	Disagree
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
3, 3	7, 6		1

9. I talk with others about environmental problems and issues.

Strongly	Somewhat	Somewhat	Strongly
Agree	Agree	Disagree	Disagree
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
4, 5	5, 5	1	

10. I know resources to contact in the community to gain the information I need to address environmental issues.

Strongly	Somewhat	Somewhat	Strongly
Agree	Agree	Disagree	Disagree
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
1, 1	5, 5	4, 4	

11. I personally take part in recycling efforts.

Strongly	Somewhat	Somewhat	Strongly
Agree	Agree	Disagree	Disagree
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
6, 4	3, 5	1, 1	

12. I do not litter and encourage others not to litter.

Strongly	Somewhat	Somewhat	Strongly
Agree	Agree	Disagree	Disagree
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
6, 4	3, 6		1

13. I try to conserve energy.

Strongly	Somewhat	Somewhat	Strongly
Agree	Agree	Disagree	Disagree
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
2, 5	7, 1	1, 4	

14. I have actively participated in efforts to improve the environment.

Strongly	Somewhat	Somewhat	Strongly
Agree	Agree	Disagree	Disagree
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
5, 3	5, 6	1	

15. I base some of my purchases on environmental considerations.

Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
3, 1	3, 3	4, 6	

16. Environmental concerns will have an impact on my decision-making as an adult (e.g., cars, energy efficiency, organic growing).

Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
5, 5	5, 5		

17. I hope to play an active role in improving the environment as an adult.

Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
4, 2	6, 8		



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