

**AN ASSESSMENT OF ENVIRONMENTAL LEARNING CENTER VISITOR
ATTITUDES TOWARDS ENVIRONMENTAL EDUCATION**

by

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by

Karin Fernbach Kraft

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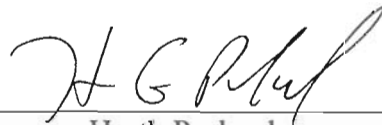
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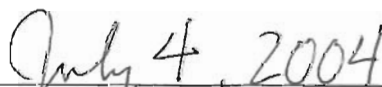
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ABSTRACT

An Assessment of Environmental Learning Center Visitor Attitudes Towards Environmental Education

Karin Fernbach Kraft

Many studies have examined the public's knowledge and attitudes about the environment. However, only a handful of questions have been asked regarding the public's attitudes towards environmental education (EE). This study involves a survey of 1165 respondents that was administered at a number of Environmental Learning Centers (ELCs) including zoos, aquariums and interpretive centers to assess visitor attitudes and awareness of EE.

This project was supported by Audubon Washington (the Washington State office of the National Audubon Society) who wanted to find out what EE messages resonate with visitors to ELCs within the state of Washington. The purpose was to determine the gaps in knowledge and awareness of EE, identify correlations between certain demographic groups and specific messages that can be used in future marketing of EE and ELCs, and correlate visitors' exposure to EE and degree of environmental concern regarding the state of the environment. ELCs were chosen because of their general support for EE and their willingness to support the administration of this survey at their site. Two comparison groups were also selected: participants to the Environmental Education Association of Washington, which convened for its annual conference during the survey period, and visitors to the Centralia, Washington Post Office because of its more rural location and historically more conservative voting patterns.

Results from this survey were remarkable. There was strong support for every EE claim tested from all three groups. Differences between demographic variables were small. In general, EEAW respondents were more highly supportive of EE than the other two groups. Nonetheless, respondents from the Centralia Post Office and the ELCs are very supportive of EE. Results from this study clearly show that a nationwide random study on EE is merited.

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CHAPTER 1

Introduction

How do people develop a deep and lasting concern for the natural environment? This is an important question for anyone who believes that a concerned and informed citizenry is central to the healthy stewardship of the earth.

Roger Hart, *Children's Participation: The Theory and Practice of Involving Young Citizens in Community Development and Environmental Care*

For many indigenous cultures throughout the world, environmental teaching and learning has been a way of life. However, in the developed and developing world environmental education (EE) is an extremely young field of study and practice. It emerged in the late 1960s and early 1970s in the United States. Rivers on fire, major oil spills and the publication of Rachel Carson's book, *Silent Spring*, in 1962 collectively brought the condition of the environment to the public consciousness. EE developed in response to the heightened awareness of environmental problems, and drew from the interests and emphases in nature study, conservation education, experiential education and outdoor education fields, which developed in the early part of the twentieth century (Braus and Disinger, 1996).

Thirty-five years after the first National Environmental Education Act (NEEA) passed in 1970, EE is taught in many different contexts such as:

- Formal education, i.e. K-12 schools, higher education,
- Non-formal education, i.e. nature centers, zoos, aquariums, and interpretive centers,
- Print and electronic media,
- Informal education, i.e. individuals learning on their own through nature observation and recreational pursuits,
- Religious educational contexts.

Environmental education is offered by many agencies, organizations, and schools and includes many types of professional teachers, interpreters, communicators, and public outreach specialists. Over the past 15 years, EE has been in the process of being

professionalized through the increase in funding and quality of training for environmental educators (MacGregor, personal communication, February 6, 2004).

Environmental education is based on ecological principles with an emphasis on the interconnectedness among society, policy and the economy. Ecology is also a relatively new science, whose understanding is essential to full comprehension of human impacts on the environment. Ernst Haeckel first coined and defined ecology in 1886 as “the science of relations between organisms and their environment” (Bramwell, 1989). Ecology comes from the Greek root *oikos*, which means connectedness. Eugene Odum and his brother Howard moved ecology from its roots as a descriptive science into modern science through initiation of quantitative studies. Eugene Odum published the *Fundamentals of Ecology* in 1953 and in 1992 published a list of the 20 most important ecological principles that should be included to improve environmental literacy, which included thermodynamics, natural selection, cyclic behavior, connectiveness, human ecology and the ecology-economics interface (Odum, 1992). See Appendix A for the complete list.

Definitions

The current definition of environmental education used in this study evolved from a definition penned by William Stapp and his graduate student seminar (1969) which stated that “environmental education is a process aimed to produce a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, aware of how to help solve these problems, and motivated to work toward their solution.” The United Nations Education, Science and Cultural Organization (UNESCO) definition,

created in Tbilisi, Georgia, USSR in 1977, was derived from the Stapp definition, but it emphasized five instead of three objectives for environmental education:

awareness to the total environment and its allied problems, knowledge of the total environment, its problems and society's role in dealing with these problems, attitudes to help individuals and social groups acquire the values and feelings for participating in its protection and improvement, skills for solving environmental problems, evaluation ability to determine measures and educational programs to deal with environmental issues and a sense of responsibility to participate in solving environmental problems.

The definition combined these objectives into one statement:

environmental education is a learning process that increases people's knowledge and awareness about the environment and associated challenges, develops the necessary skills and expertise to address the challenges, and fosters attitudes, motivations, and commitments to make informed decisions and take responsible action (UNESCO, 1978).

In the early 1970s, Stapp was asked to create the office of EE within UNESCO in Paris. For the two years that he directed the office, he traveled throughout the world, testing and getting feedback on this definition. He played a major role in planning two UNESCO sponsored conferences on EE: The International Environmental Education Workshop in Belgrade in 1975 and The Intergovernmental Conference on Environmental Education in Tbilisi in 1977. Both conferences created and endorsed similar definitions of EE and made recommendations for its implementation (UNESCO-UNEP, 1975 and UNESCO, 1978). Remarkably quickly, these conferences propelled the field of EE into the consciousness of international educational leaders. In addition, 12 guiding principles emerged from the United Nations Tbilisi Conference on Environmental Education:

- Consider the environment in its *totality*-natural and built, technological and social;

- Be a continuous *lifelong* process, beginning at the preschool level and continuing through all formal and non-formal stages;
- Be *interdisciplinary* in its approach, drawing on specific content of each discipline in making possible a holistic and balanced perspective;
- Examine *major environmental issues* from local, national, regional and international points of view so that students receive insights into environmental conditions in other geographical areas;
- Focus on current and potential environmental situations, while taking into account the historical perspective;
- Promote the value and necessity of local, national, and international *cooperation* in the prevention and solution of environmental problems;
- Explicitly consider environmental aspects in plans for development and growth;
- *Enable learners to have a role* in planning their learning experiences and provide an opportunity for making decisions and accepting their consequences;
- Relate environmental sensitivity, knowledge, problem-solving skills and values clarification to every age, but with special emphasis on environmental sensitivity to the learner's own community in early years;
- Help learners *discover the symptoms and real causes* of environmental problems;
- Emphasize the complexity of environmental problems and thus the need to *develop critical thinking and problem-solving skills*; and,
- Utilize diverse learning environments and a broad array of educational approaches to teaching/learning about and from the environment with due stress on *practical activities and first-hand experience*.

Nearly 20 years later, the United Nations Conference on Environment and Development held in 1992 in Rio de Janeiro, Brazil further delineated the field of EE. One hundred heads of state met at what became known as the "Earth Summit" to discuss environmental protection and socio-economic development. A 300-page plan was adopted for achieving sustainable development in the 21st century and was called Agenda 21. This plan called for the mobilization of the public at large and for the adoption of policies and plans on sustainable development at the national level to be supported at the international, regional and local levels and by non-governmental organizations. Chapter 36 of Agenda 21 entitled "Promoting Education, Public Awareness and Training" had three program areas for formal and non-formal education.

- Reorienting education towards sustainable development.
- Increasing public awareness towards sustainable development.

- Promoting training towards sustainable development.

In the World Summit in Johannesburg, Africa 2002, a great deal of frustration was expressed at the lack of progress over the 10 preceding years. Because of this, world leaders at the summit stated that educators must be required to place an *ethic* for living sustainably at the center of society's concerns. World leaders at the World Summit felt that a *lack of ethics* of individuals, corporations, and governments had more to do with environmental degradation than a lack of understanding of human impacts on the environment. They said that EE must be based upon principles of social justice, democracy, peace and ecological integrity (UNESCO, 2002). Finally, in October of 2003, 11 years after their first attempt to pass this resolution, the United Nations Education, Science and Cultural Organization (UNESCO) General Conference plenary passed "The Earth Charter," which is an "instrument that provides the ethical framework for a just, sustainable and peaceful global society." The Earth Charter includes "respect and responsibility for community life, ecological integrity, social and economic justice and equity, democracy, alleviation of poverty, nonviolence and peace" (UNESCO, 2003). The Earth Charter has been featured on many EE and sustainability websites, and a foldout brochure version has been circulated widely in the world: probably more than any of the previous EE declarations from UNESCO, the Earth Charter has the most visibility.

The current definition of EE used by the Environmental Protection Agency (EPA) has been reworded slightly but is virtually the same definition as the definition created in Tbilisi with one significant exception. In 1996, the National Environmental Education Advisory Council (NEEAC), which is comprised of a group of representatives from organizations outside of the federal government who provide advice to the EPA about EE

in schools, universities, state departments and educational organizations, added a clause that states “EE does not advocate a particular viewpoint or course of action.” This addendum by the NEEAC attempted to value nature and, at the same time, describe environmental study as a neutral academic pursuit.

Disinger points out a fundamental confusion of the purpose in this field, which is whether it should just be (1) a cognitive and academic endeavor, involving learning about environmental concepts and processes, and exploration of problems with no conversation or judgment about opposing viewpoints, or (2) a cognitive *and* affective enterprise involving not only environmental learning but the development of attitudes of concern and motivation to engage in activities of problem prevention, resolution, and restoration, or activities having to do with sustainability (Disinger, 1997). Environmental educators generally support the “active” part of the definition. The original Stapp definition and the Tbilisi definition did reflect an intention around attitudes, and action-taking, and civic engagement; these definitions did not limit EE to just a cognitive enterprise.

Support for EE: Brief History of Federal and State Environmental Education Legislation

The first federal legislation supporting EE was the National Environmental Education Act in 1970. This legislation resulted in the creation of the Office of Environmental Education and was housed in the Department of Health, Education and Welfare. The Office of EE coordinated a modest and poorly funded grants program of EE projects in K-12 education. This office eventually closed in the 1980s due to lack of

funding and lack of reauthorization of the act. However, President George H. W. Bush signed the 1990 National Environmental Education Act into law, and this time, the Office of Environmental Education was placed within the EPA. It was nearly closed again in 2002 under the current Bush administration's proposal to place the office within the National Science Foundation (NSF) (Baker, 2000). The opposition to this proposal, voiced by many in the EE profession, was that an NSF-directed EE program could be seen as just science, which in turn could restrict EE from being integrated throughout the basic subject areas, thus interfering with student learning about the social, political and economic implications of environmental issues (MacGregor, personal communication, 2004).

In 1985, the Washington State legislature directed the Superintendent of Public Instruction in 1985 to appoint an environmental education task force to create a definition of environmental literacy and determine the needs of environmental education in the state. The task force defined an environmentally literate person as one who can understand:

- The components of the environment and their interactions,
- The value of the environment to our physical, economic and emotional well-being,
- How personal choice affects the environment, and
- How to apply knowledge, skills and decision-making to cooperative action on behalf of the environment.

The task force recommended that an environmental education committee be established by the legislature. In 1986, a committee was established and placed under the Office of the Superintendent of Public Instruction (OSPI). The committee recommended that the inclusion of science with an emphasis on environmental education be added to the basic K-12 curriculum in all the schools in the state. In 1987, House Bill 770 passed

legislation to this effect and codified it under the Revised Code of Washington (RCW) 28A.230.020; however, no public funding for EE was provided at that time.

In 1990 the Washington State School Board passed a mandate, Washington Administrative Code (WAC) 180-50-115, that in section (6) states:

“Pursuant to RCW 28A.230.020 instruction about conservation, natural resources, and the environment shall be provided at all grade levels in an interdisciplinary manner through science, the social studies, the humanities, and other appropriate areas with an emphasis on solving the problems of human adaptation to the environment.”

As of 1998, 12 states have K-12 instructional requirements for EE with an additional three states in the development phase of similar instructional requirements (Ruskey et al., 2001). These include Washington, Oregon, Nevada, New Mexico, Wisconsin, Louisiana, Illinois, Georgia, South Carolina, Pennsylvania, Maryland, and Ohio, with legislation being developed in California, Texas and Vermont.

In 1992, Washington State's OSPI charged 54 members of the EE community to develop a comprehensive plan to meet the requirements of the mandate. This resulted in the formation of the Environmental Education Advisory Council (EEAC). The council included representation from business leaders, the education community, resource agency representatives, the tribes, and environmental groups. They agreed upon five major EE recommendations:

- Program planning, implementation and assessment.
- Teacher in-service training.
- Teacher pre-service training.
- Environmentally sound practices-model facilities.
- A systematic plan of evaluation.

The council agreed that EE is a powerful integration tool for all subjects and that the integrated EE must be the result of partnerships between public, non-profit and private sectors (Billings et al., 1994).

In an attempt to address the lack of funding for EE in WA State, the Environmental Education Partnership Fund was established by HB 1466 in the 2003 legislative session. This bill had broad support on both sides of the aisle because a diverse coalition of many environmental, education, and industry organizations worked on developing and building support for the fund. HB1466 created a competitive grants fund that will be managed by OSPI to provide funding to support EE in Washington through school bus rentals, scientific equipment, teacher training, and field trips to forests, wetlands or farms. Subsequently, in Washington State's 2004 Supplemental Operating Budget, \$75,000 was appropriated for this grant fund (Audubon Washington, 2004).

Status of EE in Washington State

In February of 2002, Washington State House and Senate Education Chairs asked the Governor's Council on Environmental Education (GCEE) to report on the state of EE in Washington. Status, funding needs and potential revenues sources for EE were to be included in this report. In the early 2000s, while interest in EE was apparently growing, and a statewide professional EE organization, the Environmental Education Association of Washington (EEAW), was becoming robust, statewide leadership and coordination for EE was becoming weaker. Downturns in both federal and state funding caused the termination of two key EE positions in the state: the office of EE coordinator at OSPI,

and the special assistant to the Governor's Council on EE, a position coordinating state agency EE efforts. This meant that volunteer task force of EE professionals had to be created in order to complete the report requested by the legislative leadership.

To determine how effective EE is in the public schools, the task force looked at a study in 1998 begun by the Environmental Education Assessment Project (EEAP). The EEAP was created to determine if using the environment to integrate subject areas actually improved student learning among other things. The EEAP consisted of environmental educators from Project Learning Tree, Washington State Forest Protection Association (WEPA), Project WILD, the WA Department of Fish and Wildlife (WDFW), Project WET, Department of Energy (DOE) and the WA OSPI. The goal of the assessment was to determine through sound quantitative analysis if EE improved student learning. Their report was the first of its kind in the nation to examine student performance and student learning change as a result of EE. This study included examining 2,116 public and private schools in the state of Washington.

In 2002, the EEAP completed its study of students in Washington State, which included 77 pairs of EE and non-EE schools. The "EE schools" had EE for at least three years with a minimum of 20% of the teachers and a minimum of 33% of the students participating in an EE program. Students attending schools with EE integrated throughout the school and curriculum were found to have higher test scores on standardized tests over comparison schools with traditional curricula. In addition, the mean percentage of students who met the standards for the WASL and the ITBS were higher in the schools with environmental programs (Bartosh, 2003). It is remarkable that schools having only 20% of the teaching staff involved in teaching EE were showing

statistically significant differences in standardized test scores and numbers of students meeting the standards set by the state.

Included in the GCEE report was the first statewide record of schools participating in EE in Washington State. In 2002, working collaboratively, the Washington State Office of the Superintendent of Public Instruction (WA OSPI), the Northwest Environmental Education Council (NWEEC), and the Washington State Office of Environmental Education (WA OEE) produced the Washington State Environmental Education Needs Assessment (WSEENA). WSEENA surveyed all public and private schools listed by the OSPI, which included 2,651 schools in an attempt to show that EE improved student learning. Of the 27% who responded to the survey, 70% reported that including EE in their instruction improved student learning and development. Seventy-seven percent were aware of the mandate for EE to be taught in all parts of the K-12 curriculum. Seventy-four percent were aware of EE's alignment with the Essential Academic Learning Requirements (EALRs) and the WASL tests. Eighty-seven percent desired more information regarding how EE can improve student learning (McWayne and Ellis, 2003). In a follow up report on this study Tony Angell, former Director of the OSPI OEE, concluded the most frequently noted barriers to using EE in schools were time, money and training (2002).

The first recommendation for the future of EE in WA by the GCEE is for a state planning process with a clear outline of goals and objectives for unifying a coordinated approach to elevating the quality, quantity and delivery of EE. There are many non-profit educational organizations that are interested and equipped to provide EE: i.e. zoos, aquariums, marine science centers, and environmental organizations. There are also

many local, state and federal agencies with mandates to conduct public outreach and education about their respective natural areas (such as wildlife refuges), resource management goals (related to sewage treatment, forests, or solid waste), or their regulations (such as air and water quality). Other recommendations by the GCEE include: the statewide infrastructure needs to be improved; funding needs should be identified and prioritized through the state planning process; and adequate funding provisions allowed by the legislature (McAuliffe et al., 2003).

Negative Critiques of EE

While there have been some critiques of EE, most of them have been laid to rest as the field has evolved. In the 1990s, some of the negative critique focused on misleading or biased information appearing in textbooks used in K-12 schools (Sanera and Shaw, 1996). Sanera and Shaw were on the right track pointing to sloppy or outright incorrect material in many K-12 textbooks. However, Sanera and Shaw's rush to condemn textbooks revealed their lack of knowledge about how EE is undertaken in most schools. In school settings, EE practice has taken a strong and deliberate step away from the use of textbooks to study outdoors where students can learn first-hand about nature and environmental issues in their community. Elementary students learn how to observe the natural world as they learn about the myriad plants and animals that live in the area. Some school classes are connecting to the Nature Mapping website in order to record their observations for anyone to see (Tudor, 2001). Fifth graders on up learn how to monitor water quality in streams and lakes as they learn about wetlands and watersheds. Middle school and high school students learn how to think critically about environmental

problems and solve problems in their local community (Howe et al., 1989). Thus, much environmental learning is field and community-based, not textbook-driven.

A second element of the critique by Sanera and Shaw (1996) was that children exposed to EE were being trained to become activists. Sanera and Shaw found instances where children were writing Congressional representatives about things they knew nothing about, or where school children were attending political events with placards. Sanera and Shaw generalized from isolated incidents such as these to paint the whole EE field as irresponsible and politically motivated by an activist “green agenda.” Sanera and Shaw also failed to comprehend that learning how to participate in a democracy is a process where skills develop over time. Other educators argue that teaching children to write letters to their representatives and other acts of responsible citizen participation should have been an integral part of public schooling since its inception because a true democracy is based on an engaged, informed, and active citizenry (Orr, 1993, Pitt, 2003). Learning how to become civically engaged is billed as one of strengths of EE. Sanera and Shaw created a firestorm over isolated bad practices when much of EE practice strives hard to create a balance, so that students learn to think and decide for themselves how best to solve environmental problems and also learn the varied political and economic processes for prevention and resolution of environmental problems (Smith, 2000).

Throughout the Clinton years, Sanera and Shaw worked collaboratively with various conservative organizations at the state level in many different states to attack and stymie EE. In Washington state, The Center for Environmental Education Research of Tucson, Arizona teamed up with the Evergreen Freedom Foundation in Olympia,

Washington to write a K-12 Environmental Education Report Card for Washington State (1999). This report, strongly criticized by EE professionals in Washington, went nowhere and the assault on EE in the state of Washington ceased shortly thereafter.

Even though Sanera and Shaw are no longer active, the controversial nature of EE continues to flare up. The heart of the controversy seems to be political implications surrounding concepts of sustainability, environmental protection, public health and natural resource protection. On April 25, 2004 a full- page advertisement was taken out in the *Oregonian* that attacks “Education for Sustainability” as a subversive plot hatched by the Green Party and from environmental groups to the Democratic left to “brainwash” teachers and children to the values of the International Green Party. The advertisement titled, “It’s Not Nice to Brainwash Kids,” was funded by the for-profit organization, Operation Green Out! (*Oregonian*, 2004).

This fear-based and highly exaggerated attack demonstrates a lack of understanding about the goals, objectives, and practices of environmental education. Operation Green Out! claims that students, parents and teachers are being brainwashed by “Green extremists” similar to dictators such as Hitler and Lenin. It also attacks a group called Second Nature, which it calls the “brainchild” of Senator John Kerry. Second Nature has been a respected resource center for faculty and instructors of higher education on EE and sustainability for well over a decade (MacGregor, personal communication, 2004).

While it may be true that some EE practices have been irresponsible and not well delivered, on the whole the profession has strived for balance, objectivity and accuracy. EE focuses its work on the development of critical thinking skills and teaching students

how to think, not what to think. In brief, critical thinking skills teach students to look at differing points of view in an attempt to understand what the conflicting interests are in order to work towards win/win solutions (Kurfiss, 1998; Schindler and Lapid, 1989; Hungerford, 1996).

Environmental Education at the 35 Year Point

The field of EE was born at a time of growing alarm about environmental degradation. While there have been some real improvements to air and water quality in the U.S. over the past 35 years, a number of environmental problems have become much worse.

- Carbon dioxide levels taken from 11,400 ft. summit of Mauna Loa, Hawaii have increased each year for the past 46 years that measurements have been taken (CDML, 2004). The last 4 years have seen three of the largest increases on record. See Figure 1.1 and Figure 1.2. Many scientists have expressed repeated warnings regarding the severity of the implications if global warming remains unchecked.

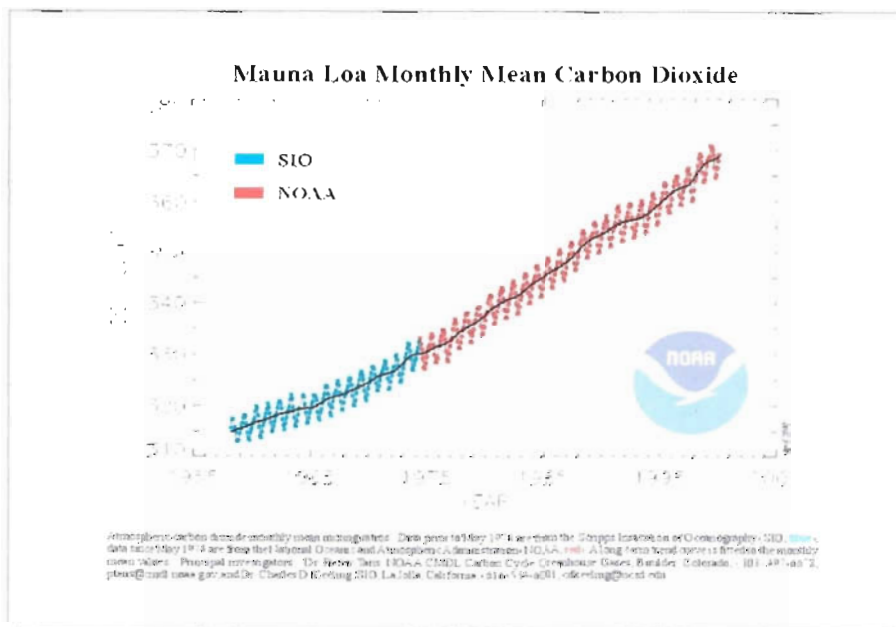


Figure 1.1

(NOAA 2003)

Paleoclimate and CO₂: Temperature and CO₂ Over the Last 1000

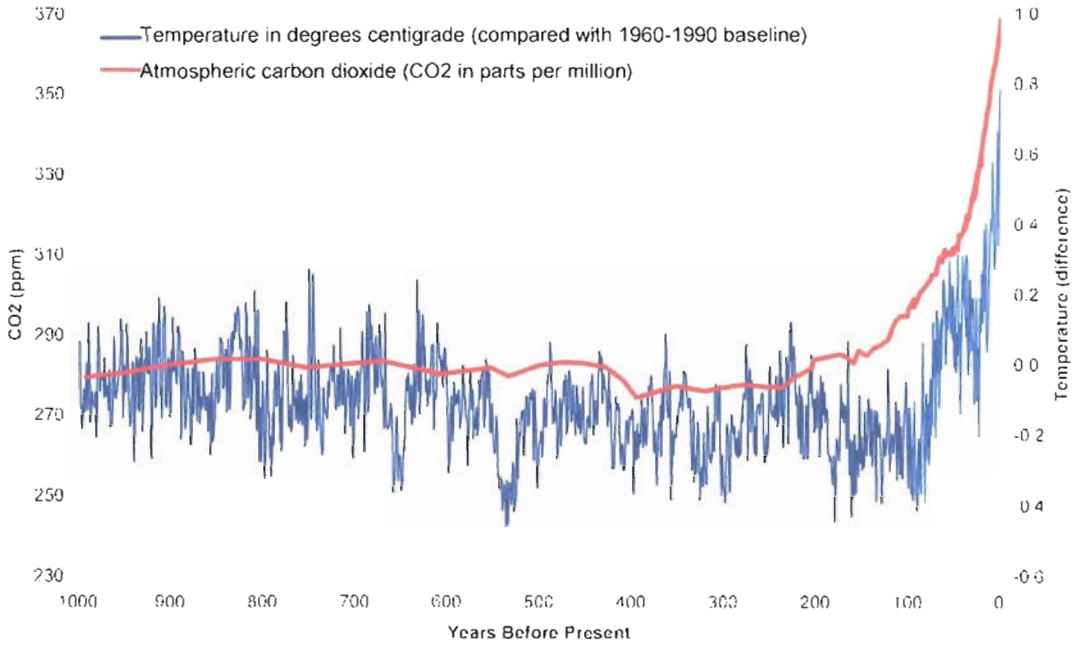
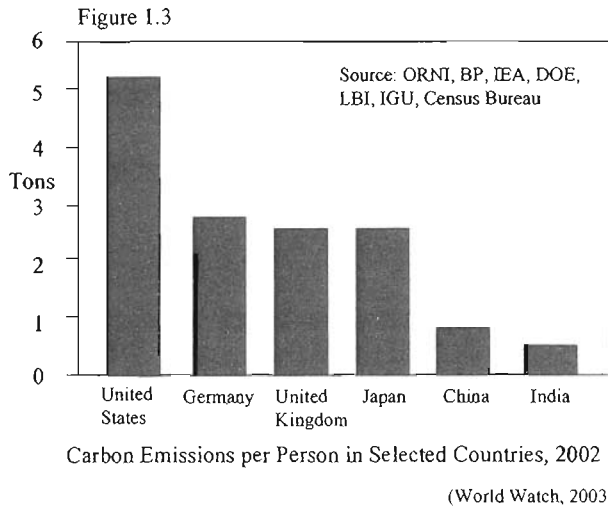


Figure 1.2.

(Rees, 2001)

This graph provides northern hemisphere temperature approximations over the past 1000 years based on climate proxies (dark blue) from tree ring data and thermometer based recording (light blue) (Mann et al 1994). CO₂ concentrations (red) are those recorded in the Law Dome, East Antarctica ice core and at the Mauna Loa monitoring station in Hawaii.

- As of April 15, 2004, 122 nations have ratified or acceded to the Kyoto Accord and 84 nations have signed (UNFCCC, 2004). Currently the United States is the largest contributor to global greenhouses gasses generating 25% of the worlds' carbon dioxide and has not yet signed the accord. See Figure 1.3 below.



- Loss of habitat and species continues to grow (Biodiversity Project, 2002). Many recent rollbacks of environmental laws and regulations at the federal level may exacerbate the situation.
- U.S. Congressman Dennis Cardoza (CA) has introduced a bill, H.R. 2933 that will severely limit the ability of the Endangered Species Act to protect endangered species and their habitat. Instead of requiring habitat be designated at the time a species is listed, critical habitat would be designated at the time a species' recovery plan is developed. Since deadlines for recovery plans do not exist, habitat designation could be delayed. In addition, under this bill, the definition of critical habitat will be changed to "absolutely necessary and indispensable" to the conservation of the species. This would make every designation by Fish and Wildlife open to litigation (USPIRG, 2003).
- In a report released by Audubon Washington on May 6, 2003, of the 317 species of birds found in Washington State 93 species and four subspecies are considered vulnerable or are identified as priority species for conservation action (Cullinan, 2004).
- Mercury poisoning continues to be a problem causing birth defects, problems with the immune system, genetic and enzyme system alterations, and nerve damage in humans

and in wildlife, especially in the Midwest and around the Great Lakes region of the U.S. where it is released as methylmercury in industrial emissions (USGS, 2000).

- Polychlorinated biphenyls (PCBs) are now ubiquitous worldwide carcinogens. They bioaccumulate, thus becoming more concentrated as they move up the food chain (Bolin, 2002). Polybrominated diphenyl ethers (PBDEs) replaced PCBs in many applications such as computers and textiles, and are now known to be equally hazardous to PCBs (WADOE, 2004). Currently whale carcasses that wash on shore are so contaminated with PCBs that they can be considered hazardous waste sites (Ross et al., 2000).
- The U.S. Commission on Ocean Policy (US COP) recently released a report of the state of the world's oceans, which stated that over-fishing, pollution, and a rise in ocean temperature are severely affecting life in the ocean (US COP, 2004).

These are just a few examples of information about the state of the environment in the world. Clearly there is still a need for a citizenry that is informed about the environment and engaged in solving or preventing environmental problems. In addition, there remains a need for educational processes that focus on learning to think critically concerning personal actions and the actions of others relative to environmental stewardship in order to work collaboratively to find solutions.

Assumptions

The underlying assumption of this thesis is that EE is capable of creating an environmentally literate society that can make positive environmental choices and behaviors and find solutions to environmental problems in its communities in order to

live sustainably on earth. People must have knowledge about the environment in order to discuss the issues involved and they need critical thinking skills provided by EE to be able to evaluate and understand perspectives of others.

CHAPTER 2

Impetus for this Study and Background

Audubon Washington

Audubon Washington, the state office of the National Audubon Society, generated the impetus for this study. The mission of the National Audubon Society (NAS) is “to conserve and restore natural ecosystems, focusing on birds, other wildlife, and their habitats for the benefit of humanity and the earth's biological diversity” (NAS, 2004). NAS wants to help create an environmentally literate society that will be able to respond to the needs of the future. One of the goals of the Audubon state office is to increase the culture of conservation in Washington and to establish Washington as a national leader in environmental education. Audubon Washington’s EE goals include: 1.) To increase access to quality EE for children and adults statewide; 2.) Increase funding for existing and planned EE programs; 3.) Increase the institutionalization of EE in public schools and community programs; and 4.) Advance its mission and strategic plan to build a network of Audubon centers throughout the state (Packard, personal communications, 2004).

Audubon Washington is interested in helping citizens in Washington understand, appreciate, and therefore, seek out, support and demand more EE for their children and families. Thus, Audubon Washington seeks to develop a positive awareness and understanding of EE. Because of this, Audubon Washington wanted to survey the public to see what the current perceptions are towards EE and to see which messages regarding EE resonate with the public. Audubon believes that it is crucial to work with the public to develop a direction for the future. This forward

thinking approach, which focuses on community attitudes is known as social marketing.

Social Marketing

Social marketing is a fairly new concept and practice that is derived from commercial marketing and behavioral psychology. In 1971, Philip Kotler and Gerald Zaltman coined the term “social marketing” in an article published in the *Journal of Marketing*. “Social marketing” was used initially to advance social behaviors related to public health issues. Initially family planning was the main venue for social marketing which led to work on the HIV/AIDS epidemic in the 1980s and early 1990s. The Centers for Disease Control and Prevention has adopted social marketing into many of its programs. Social marketing is currently used nationally and internationally in business, public health, public policy, and environmental management (Kotler et al., 2002).

Social marketing is typically used by non-profits and government agencies that are involved the tasks of changing behaviors of targeted groups (GreenCOM, 2000). According to Alan Andreason (1995), social marketing is “the application of commercial marketing technologies to the analysis, planning, execution and evaluation of programs designed to influence the voluntary behavior of target audiences in order to improve their personal welfare and that of society.” It is the inverse of trying to coerce or force beliefs or behaviors on to the public. It is a method of working with people, looking for common interests and beliefs, and

unifying efforts, in Audubon's case to conserve and restore biodiversity and the natural environment and nurture healthy communities.

Differences Between Social and Commercial Marketing

Social marketing differs from commercial marketing because in commercial marketing, there are generally very clear goals such as a set percentage of market penetration or introduction of product name. Commercial marketers generally have immense budgets to accomplish small results. In contrast, social marketers usually have extremely difficult challenges of motivating behavioral changes in targeted populations; these efforts often take on ambitious goals under severely restricted budgets (Andreason, 2000).

Table 1 Differences Between Social and Commercial Marketers

Social Marketers	Commercial Marketers
Want to do good	Want to make money
Funded by taxes, donations	Funded by investments
Publicly accountable	Privately accountable
Performance hard to measure	Performance measured in profits, market share
Behavioral goals long term	Behavioral goals short term
Often target controversial behaviors	Typically provide non-controversial products/services
Often choose high risk targets	Choose accessible targets
Risk averse managers	Risk taking managers
Participative decision making	Hierarchical decision-making
Relationships based on trust	Relationships often competitive

(Andreason, 2000)

Commercial marketers traditionally teach the 4 Ps: product, price, place and promotion. The product refers to what is sold; the price is what the customer pays; the place is where the product may be purchased; and the promotion is the advertising that draws in the customers. In social marketing, the product is the idea, belief or

behavior change that an organization would like to have implemented; the price is time, money or behavior change that the target audience will have to bear in order to achieve the product; the place is where or the media where the audience receives the message; the promotion is the message that draws attention to the product, and the participation, which is an additional P, refers to the input that the targeted audience provides in order to implement the product. Sometimes in social marketing the Ps becomes Cs, changing from an organization perspective to an audience perspective. The four Cs are “consumer” wants and needs, “cost” to satisfy these wants and needs, “convenience” to obtain them, and “communication” (Shewchuk, 1994).

Social marketers typically use a 5-step process for creating behavior change, such as the one used by GreenCOM. GreenCOM is the Environmental Education and Communications Project funded by the U.S. Agency for International Development (USAID) that promotes “strategic participatory communications” worldwide to foster sustainable environmental practices. The first step in the GreenCOM model is to assess the target audience to try to understand why people carry out certain behaviors. In the assessment, it is important to find out what the differences are between people who carry out the desired behaviors and those who do not.

The second step is the design and planning step and the purpose is to find an incentive that will satisfy the target audience in order to get them to adopt the desired behavior. This step should answer the question for the audience, “What is in it for me?” The messages that social marketers craft need to answer this question. By looking at the benefits and barriers, a message is designed that people will be most likely to relate to. In the third step, these messages are usually tested on a small

group within the targeted audience. Research about how and where the audience gets information helps determine how to implement the message.

The fourth step is the implementation step, which includes various forms of message delivery, and the fifth step consists of monitoring and evaluation. Changes in the messages may be needed as the needs of the audience change over time. Therefore the monitoring and evaluating may result in changes that then need to be pretested and revised before the next round of implementation. See Figure 2.1 below.



Figure 2.1

Les Robinson has introduced a new model of social marketing that involves seven steps to social change (1998). He states that each step should be expressed as an affirmation or positive step even though each is actually a barrier. He suggests viewing the seven steps as a set of seven doors. See Figure 2.2.

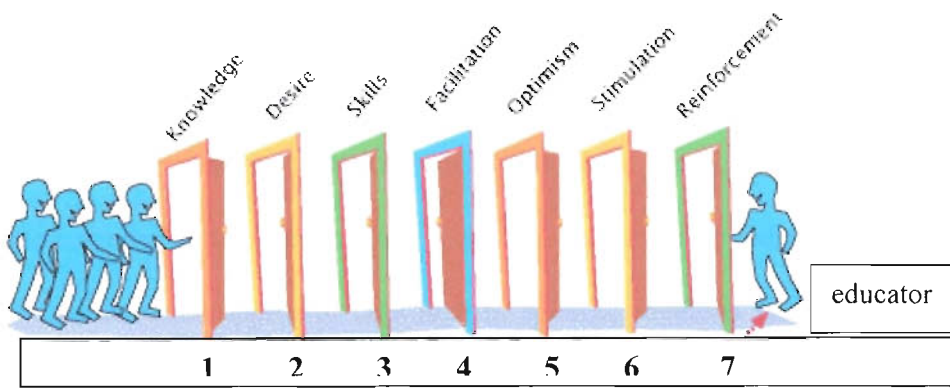


Figure 2.2

(Robinson, 2003)

In this model knowledge and awareness present the first obstacle to behavior change in that people must know that there is a problem, that there are alternatives or solutions to the problem, and that there are personal costs to inaction. The second step involves the use of imagination so that people can see a different and better future for themselves. This use of imagination ideally creates desire. (This step is often used in commercial marketing when products are marketed with a sexy image to create desire in the form of lust, fear, envy or greed.) The third step involves developing skills. Skills must be introduced: for example, a video might present images of people performing the desired behavior or a booklet might offer clear instructions. Step 4 is the facilitation of the personal behavior by providing services and infrastructure to enable people to perform the desired behavior: for example, curbside recycling programs provide residents with special recycling cans or bins. Step 5 involves the transmittance of optimism or confidence. Robinson is unclear about how this would be achieved, although he suggests that community leadership may be important here. Step 6 is the stimulation that compels people to act. This could be incentives, positive or negative, or a community event such as a telethon, a public meeting or a festival. The seventh and last step is feedback and reinforcement

and is achieved by letting people know the success of their efforts. It is also carried out through the reinforcement of messages (Robinson, 2004).

The advantages to the Robinson model appear to be the planned community event to launch a new campaign and the feedback that is provided to the target audience. The weaknesses appear to be a lack of specific methods for transmitting optimism or confidence, and a lack of evaluation and modification within the model.

The Robinson model of social marketing, with its incentives and facilitators is designed to change behaviors over a short period of time. According to Michael Rothschild, both commercial and social marketing are about influencing individuals who act out of self-interest and change their behavior only when there is a perceived benefit. Marketers who lack formal training must not underestimate the self-interest of the target, and the need to invest time in learning from the target audience (Rothschild, 1999).

Social marketing, simply stated, involves using commercial marketing principles to induce behavioral changes that benefit individuals and society. These behavioral changes were initially related to public health issues but have expanded to include environmental issues as well. The 5-step GreenCOM model involves a feedback loop to ensure close contact with the targeted population in order to maintain awareness of any changes in its wants and needs. The 7-step Robinson model appears to focus most of its work in the planning and implementation phases. This model does not include an initial assessment of the target audience. It emphasizes using educators to help people overcome barriers. In addition, while the Robinson model suggests providing feedback to the target audience, it mentions

nothing in regards to the monitoring and evaluation of the program. This feedback loop is one of the strengths of the GreenCOM model. Ideally, a more effective program would include elements from both the GreenCOM model and the Robinson model. Community-based social marketing developed by Doug McKenzie-Mohr in the late 1990s does exactly that.

Community-Based Social Marketing

Community-based social marketing is social marketing designed specifically to enhance the efforts of the movement towards sustainability. Community-based social marketing is a pragmatic approach that involves identifying barriers and benefits to a specific sustainable behavior, designing a strategy that uses behavior change tools, piloting the strategy with members in a community, and then evaluating the program once it has been implemented (McKenzie-Mohr and Smith, 1999). Community-based social marketing is important because McKenzie-Mohr and Smith add extensive research on behavior change and psychology to marketing principles. Probably the most important feature of community-based social marketing is the community focus: face-to-face interactions with people.

Identifying the barriers and benefits is a crucial step in the community-based social marketing process. There are three steps to identifying barriers and benefits regarding a behavior change. The first step involves a thorough literature review regarding the activity targeted for change. The second step involves observational studies of people already carrying out the desired behavior. McKenzie-Mohr argues that direct observation is more beneficial than self-reporting by individuals because it

provides more reliable, less exaggerated accounts of the desired behavior. The second step also uses focus groups to question people who carry out the desired behaviors. The third step uses the information gleaned from the first two qualitative steps to create a survey that can be quantitatively analyzed.

There are four behavior change tools recommended by McKenzie-Mohr. The first behavior change tool is getting a commitment from an individual that he/she will try a new behavior. Written commitments have been shown to be more effective than verbal commitments. Second, developing community norms that encourage people to behave more sustainably is a second helpful tool. Peers engaging in the desired new behaviors have tremendous influence in getting others to change their behaviors. Third, direct personal contact by individuals making direct appeals to others to change behaviors is a key tool in the community-based social marketing process. This can be in the form of training community block leaders to model behaviors for their neighbors. This modeling of behaviors also creates the social norms that make it easier for others to follow. Prompts are the fourth tool in the community-based social marketing strategy that helps to remind people to follow through with their commitment to a new sustainable behavior. Prompts should be noticeable, explicit, and encouraging (McKenzie-Mohr, 1999).

Pilot testing a small portion of the community can be a major cost saving factor of the community-based social marketing strategy. Conducting pilot studies allows for changes to be made in the implementation before the effort is performed on a large scale. The pilot test also demonstrates how effective the program is likely to

be when it is implemented on the large scale; thus, it can be influential in getting support from funders.

Once the study has been implemented throughout the community, the community-based social marketing approach encourages timely evaluations of the program. This evaluation looks at direct measurement of behavior change and does not rely on self-reports or changes in awareness about behavior. Before implementing a program it is important to establish a baseline measurement for a given behavior in order to be able to gauge the efficacy of the program after its implementation. It is important to provide feedback about the progress made regarding the new behavior to the community so that the community can be encouraged. This feedback will also help create a social norm supporting the new behavior.

Social Marketing of Environmental Education

Using social marketing strategies, the first step for Audubon Washington was to clearly define the goals of this project. Audubon's primary goal is to create an environmentally literate society by strengthening and developing formal and non-formal environmental education in Washington. Audubon Washington was interested in using a social marketing strategy to learn about public awareness, knowledge and attitudes about EE. Audubon realized that messages must be designed to meet the needs of target audiences in order to be effective, so they wanted to test messages about what EE professionals understand are the benefits of EE. They asked me to

undertake this research as a master's thesis project. My first step was to investigate the literature to understand what research of this nature had been done.

Review of the Polls Regarding General Public

In 1992, the Times Mirror Magazines, in a collaborative effort with Roper Starch, initiated the National Report Card to assess environmental knowledge in America. In 1995, the National Environmental Education and Training Foundation (NEETF) took over the project and this organization has continued to work with Roper Starch to survey the public each year in order to gauge changes in what people know over time. This annual survey averages approximately 2000 respondents 18 years of age and over each year. The interviews are conducted by telephone and households are randomly selected.

This environmental survey by NEETF/Roper in 1997 and 2000 asked: "Do you think environmental education should be taught in schools?" In 2000, 95% of all respondents across the U.S. approved of environmental education, up one percentage point from 1997. In addition to this phenomenally high response rate, 86% of Americans agreed that government should support environmental education programs. Fifty-seven percent of respondents agreed that EE helps prepare children to better understand environmental issues as adults and 50% agreed that it teaches children to respect people and places around them (NEETF/Roper, 2001). Because of the high level of positive support for EE in the 1997 and 2000 NEETF/Roper Polls, the next logical step would be to find out in more detail what the public knows and thinks about EE. To date there have not been any in-depth studies on public attitudes

towards EE (Archie, 1996; Coyle, personal communication, 2003; Volk, personal communication, 2003; Ruskey, personal communication, 2003; and MacGregor, personal communication, 2003).

In these surveys about attitudes toward the environment, gender differences have been noted with women favoring environmental protection over men. For example in the 1998 NEETF/Roper survey, 51% of women felt that regulation to protect the environment should be stronger, while only 41% of the men held that opinion (NEETF/Roper, 1999). In the 1999 survey, knowledge questions were asked to see if people were better informed about how energy is produced, where trash ends up and what the major sources of water and air pollution are. While 70% rated themselves as having either a lot or a fair amount of environmental education, 66% of Americans scored a “D” or lower on the knowledge quiz of fairly elementary environmental concepts. These surveys also revealed that environmental knowledge is impacted by level of education. Respondents with some college or a college degree scored significantly higher than those with a high school diploma. Age also was a factor that correlated with higher test scores. Americans age 35-54 had the highest environmental knowledge scores while those 65 and above scored the lowest. Region also displayed interesting results as Americans from the West boasted the highest scores in environmental knowledge while Americans from the South scored the lowest. The questions with the largest differences in scores among the four regions of the nation were those that asked about biodiversity, disposal of nuclear waste, and ability to name an example of a renewable resource. Lastly suburban residents were

significantly more knowledgeable about environmental matters than urban or rural residents (NEETF/Roper, 2000).

In the past decade, the Biodiversity Project, an organization devoted to promoting the preservation and conservation of the diversity of plant and animal species, commissioned Belden and Russonello Research and Communications (BRRC), a private survey firm, to conduct several surveys on biodiversity issues. The BRRC found in a nationwide survey in 1996 of 2,000 adults, that only 19% of the American public was familiar with the term “biological diversity.” Despite that response, 45% defined biological diversity or biodiversity as loss of species (Biodiversity Project, 2002). In 2002, 30% of the respondents were familiar with the term, and 33 % knew what it meant. Often people are unfamiliar with terms but are able to make educated guesses as to their meanings. In the 2002 survey 58% of Americans believe that it is their responsibility to future generations to leave nature in good shape. Sixty-two percent felt that it was very important that we have strong protections to ensure that our natural treasures in the U.S. are not destroyed. Demographic groups including women, African Americans, Hispanics, and 40-59 year-olds ranked the intrinsic value of nature significantly higher than other groups (The Biodiversity Project, 2002). There were no questions on these surveys specifically about EE.

In The 22nd Annual Gallup Poll of the Public’s Attitudes Toward the Public Schools published by Phi Delta Kappan in 1990, respondents were asked to rank what they would like their public high schools to teach beyond the basics. Environmental issues and problems were ranked fifth in a list of 12 items. Drug abuse education was

at the top of the list, followed by alcohol abuse education, AIDS education, and sex education (Elam, 1990). EE was followed in importance by teen pregnancy, driver education, character education, parenting/parent training, dangers of nuclear waste, dangers of nuclear war and communism/socialism. There was no explanation as to how each education topic was selected for this list. Ten years later in the 32nd Annual Gallop Poll, environmental issues rated third in importance out of three topics after drug and alcohol abuse and racial and ethnic understanding and tolerance. Questions about the environment were not included in the 33rd, 34th, 35th Annual Gallup Polls administered in 2001, 2002 and 2003

Review of Teacher Surveys and Focus Groups

Even though the general public has been only superficially surveyed about their attitudes toward EE, teachers have been interviewed and surveyed more often than the general public in regards to their knowledge and attitudes about EE. While they do not necessarily represent the general public's view of EE, teacher perspectives may provide some insight into questions that should be asked of the general public. As a group, teachers seem to be very positive about EE, especially those who have integrated it into their teaching methods (Lieberman and Hoody, 1998; Kearney, 1999; McCrae and deBettencourt, 2000; Angell, 2002; and Hart, 2003). The strong support for EE by teachers would probably make an excellent message to market to the public. It is possible that the public is not aware of the positive attitude teachers have for teaching EE.

In 1998, the State Education and Environmental Roundtable (SEER) attempted to illustrate the positive effects of using the environment as an integrating

context (EIC) in K-12 schools. SEER is a cooperative effort of education agencies from 12 states:

- California Department of Education
- Colorado Department of Education
- Florida Office of Environmental Education
- Iowa Department of Education
- Kentucky Environmental Education Council
- Maryland State Department of Education
- Minnesota Department of Education
- Minnesota Green Print Council
- New Jersey Department of Education
- Ohio Department of Education
- Pennsylvania Department of Education
- Texas Education Agency
- Washington Office of the Superintendent of Public Instruction

The Environment as an Integrating Context (EIC) framework explicated by SEER implies interdisciplinary, collaborative, student-centered, hands-on, and engaged learning. In this study, SEER interviewed and surveyed more than 250 teachers and administrators, 400 students, and a few parents and alumni from 40 schools including 15 elementary, 13 middle, and 12 high schools. All 40 schools were actively engaged in using methods congruent with the EIC framework. In this report, students and their teachers reported improvements in all academic and behavioral areas (Lieberman and Hoody, 1998). The study appears to have two weaknesses that are not addressed in the report. First, it does not include test results specific to EE curriculum. Based on the report, teachers seem to use the methods of EE without the content (or at least content is not described); however, the methods alone appear to be helping both students and teachers a great deal. Second, the results from this study might have been more meaningful if a comparison group of non-EE schools had been included.

In a survey of 295 teachers of Washington State in 1999, it was shown that there are no significant differences between EE and non-EE teachers in terms of their perceptions of EE, attitudes towards the environment and the demographic variables of age, education and gender. Teaching variables such as length of service and class size also did not show any significant differences nor did the school variables such as location and income level of students. The primary difference found was that EE teachers were more likely to teach math and science than English, social studies or history. More training on effective EE teaching strategies might facilitate the integration of EE into liberal arts classrooms (Kearney, 1999).

In a survey conducted by the Survey Research Center at the University of Maryland for the NAAEE and the Environmental Literacy Council, researchers asked teachers both why they taught EE and why they did not. They found that the main reason teachers teach about the environment is to encourage students to be active in protecting the environment. Over 50% of the teachers listed this as their primary reason. The second most reported reason at 22.4% was that teachers want to demonstrate that what students are learning in class is relevant to their everyday life. The remaining teachers who were not teaching EE (48.8%) reported that they did not teach about the environment because it was not relevant to their curriculum. The second most commonly cited reason for not teaching about the environment (27.1%) was that teachers said they had too much other material to cover (McCrea and deBettencourt, 2000).

A more recent study done by the Environmental Education and Training Partnership (EETAP) in 2002 involved focus groups of non-science teacher

perceptions of EE. The purpose was to identify teachers' perceptions about EE in order to develop messages about EE and EE training using language and knowledge about EE that is already familiar to the teachers. Five focus groups were held with a total of 51 participants. The pilot focus group was conducted in Wisconsin Rapids, Wisconsin. Two study focus groups were held in Appleton, WI and two were held in Alexandria, Virginia. As an icebreaker, teachers were asked to comment on how comfortable they were to trying new materials and methodologies in their classrooms. Most responded that they were willing to try new things if there was a good reason for doing so, but they wanted to have adequate training and connections to curriculum standards in order to be effective.

Participants were then asked to "react to the phrase 'environmental education' with the first words or comments to come out of their mouths." Six themes emerged from the participants' reactions. First and foremost, respondents listed current environmental issues. Second, EE was considered an extension of science. The remaining themes included EE was associated with natural resources professionals, with environmental actions, and negatively associated with words such as vague or boring, and lastly negatively associated with "environmentalism."

Researchers for EETAP also found in this study that the best way to discuss EE is not to call it "environmental education" because the phrase causes some teachers to "tune out" too quickly. By continuing to refer to EE when messaging teachers, it might mean that teachers will be unlikely to listen to messages that include EE in them. Teachers will be more likely to listen when the educational value of EE has been demonstrated with specific examples of success (Holsman, 2002). It

is unfortunate that researchers discovered this negative view of EE but did not illuminate precisely what this perception was based on. The drawback to focus groups in general is the limitation to the number and range of people queried. Depending on the experience of the moderator, peer pressure can unduly influence respondents if nothing is done to prevent it, or clarify everyone's perceptions in a focus group. Despite some negative feedback about the term "environmental education," researchers found that connections to standards were clearly the most important factor in deciding to incorporate EE into classroom teaching.

Results from a survey conducted in Washington State showed different results than those posted by the EETAP focus groups. In this survey, which was developed by the Northwest Environmental Education Council and the Washington State Office of Environmental Education, researchers found that 70% of the educator respondents said that EE in their instruction was an important factor in improving student learning and development (Angell, 2002). Eighty-seven percent requested more information on how EE could help improve student learning.

Summary of Literature Review

Based on a review of the literature about public perceptions of EE, it becomes clear that this topic has received scant attention by EE researchers and is in need of further investigation. The studies by Roper/Starch provide the most relevant information, but their questions are too few in number to answer all the questions that Audubon Washington and others want to know. From the dearth of information available on the general public's interest in EE, it is apparent that further investigation

of the general public's interest is warranted. From the review of the surveys taken by teachers, all reports reveal either teachers' enthusiasm for the effects that EE has had in generating student interest in the classroom or teachers' interest in learning more about EE.

CHAPTER 3

Research Design and Methods

Survey Development

The survey design team for this project included Jean MacGregor, Co-Director of the National Learning Communities Project at The Washington Center for Improving Quality of Undergraduate Education at The Evergreen State College, Heath Packard, Field Director at Audubon Washington, Nina Carter, Policy Director at Audubon WA, and myself. In this chapter the term “we” and “our” refer to the survey design team. As Chapter 2 indicated, there is very little information about what the general public knows and believes about environmental education (EE). Our project aimed to learn how the general public in Washington State would respond to the messages that EE professionals use to market their programs. Audubon and other professional environmental educators use a variety of messages that can be organized under four core areas. These include environmental, academic, economic and community messages:

Environment

- EE creates and environmentally literate citizenry.
- EE demonstrates a link between environmental health and human health.
- EE shows how preventing pollution is cheaper than clean up and mitigation.
- EE encourages preservation of our natural heritage.
- EE helps conserve and restore our natural environment.

Academic

- EE increases academic achievement.
- EE decreases behavioral problems in the classroom.
- EE promotes critical thinking.
- EE makes the learning relevant to students, teachers and parents.

Economic

- EE promotes a sustainable economy.
- EE promotes stewardship of natural resources.
- EE saves money because it costs less to prevent environmental problems than to clean them up.

- EE prepares people for jobs in natural resource management and environmental fields.

Community

- EE helps learners resolve conflicts.
- EE connects children with their communities.
- EE engages communities in schools and student learning.
- EE promotes opportunities for community involvement.

Developing and testing which of these messages resonate with the general public is part of Audubon Washington's strategic plan to establish an environmentally literate citizenry in Washington. This plan incorporates five steps:

- Create partner organizations by coordinating and engaging diverse stakeholder groups;
- Identify key locations and constituencies for EE advancement such as schools, parents and businesses;
- Develop and test public messages;
- Deliver the messages through spokespersons via media stories, editorials, letters to the editors, and stakeholder forums and meetings; and
- Expand EE advocacy through Audubon centers and chapters, state and local agencies, the “State of EE in Washington” Report, Governor’s Council on EE, Environmental Education Association of Washington, and state and federal EE policy and funding mechanisms.

Our purpose in using a social marketing strategy to perform an in-depth survey of the general public was to provide a more nuanced understanding of public knowledge and opinions relating to EE. We also wanted to discover to what degree different groups (i.e. gender, age, occupation, level of education, parent or grandparent of children under age 19, political views, area of residence, and level of community involvement) held these

opinions. For this study we surveyed 1002 visitors to interpretive centers, (i.e. zoos, aquariums and other paid-admission wildlife parks) statewide. In addition we surveyed 99 visitors to a post-office and 64 EE professionals to provide comparisons to the visitors to the environmental learning center study group.

Questions for this survey were derived from many publications on EE, from numerous conversations with leaders in the field of EE, and from the survey design team. The EE leaders who provided feedback for early drafts of the survey included Abby Ruskey, President of the Board of the North American Association for Environmental Education and Co-Director of the National Environmental Education Advancement Project; Kevin Coyle, Director of the National Environmental Education and Training Foundation; Joe Heimlich, Program Leader of Environmental Sciences at Ohio State University; Kathryn Owen, Audience Research Coordinator of Woodland Park Zoo; Rachelle Donnette, Education and Outreach Specialist of Thurston County Environmental Health; and Jean MacGregor, Co-Director of the National Learning Communities Project at The Washington Center for Improving Quality of Undergraduate Education at The Evergreen State College and my thesis advisor. For clarity, the discussion of the development of the questions will follow the order in which each appeared in the survey. The complete survey, as presented to respondents, is found in Appendix C.

<p>Q. 1. Were you aware that there is a field of study known as environmental education?</p>	a. Yes	b. No
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The purpose of the first question was simply to see if respondents were aware of term, “environmental education.”

Circle the item that is closest to your opinion.

2. How well could you explain what environmental education is to a friend?

Not at all	Moderately well				Very Well	
1	2	3	4	5	6	7

Question 2 was designed to see how well people think they can explain the concept of environmental education to someone else. When people state that they are able to explain a concept, they generally have a fairly good understanding of it. We then wanted to find out what respondents learned as a child or a teenager in relation to EE.

3. As a child or teenager, were you ever educated by anyone in school or out of school about:

- | | | | |
|--|--------|-------|-------------------|
| a) The natural environment? | 1. Yes | 2. No | 3. Can't Remember |
| b) Environmental problems such as air and water pollution? | 1. Yes | 2. No | 3. Can't Remember |
| c) Preventing environmental problems? | 1. Yes | 2. No | 3. Can't Remember |
| d) Ways to clean up environmental problems? | 1. Yes | 2. No | 3. Can't Remember |

The purpose of Question 3 was to find out if older adults have had less exposure to EE than younger adults, and if there are age differences as well between the types of information received. We were curious as to whether awareness of environmental problems has grown in recent years. If so then we would expect younger adults to have had more exposure to EE related to *environmental problems*.

4-B. Now, think about the **present**, and how frequently you engage in **environmental learning** through each of the following sources. Circle a number below for each item listed.

**Environmental
Learning
Sources:**

	Not Applicable	Never	Rarely	Occasionally	Often
a. nature centers	/	0	1	2	3
b. zoos	/	0	1	2	3
c. aquariums	/	0	1	2	3
d. museums	/	0	1	2	3
e. service clubs (Rotary, etc.)	/	0	1	2	3
f. hobbies/hobby clubs	/	0	1	2	3
g. religious institutions	/	0	1	2	3
h. family members	/	0	1	2	3
i. local/regional, environmental organizations. (Audubon, etc.)	/	0	1	2	3
j. TV programs	/	0	1	2	3
k. friends	/	0	1	2	3
l. radio	/	0	1	2	3
m. newspapers	/	0	1	2	3
n. magazines	/	0	1	2	3
o. academic journals	/	0	1	2	3
p. websites	/	0	1	2	3
q. community service orgs	/	0	1	2	3
r. science centers	/	0	1	2	3
s. school	/	0	1	2	3
t. work place	/	0	1	2	3
u. parks/refuges	/	0	1	2	3
v. other	/	0	1	2	3

The purpose for this lengthy question was two-fold. First, we wanted to find out what were the top sources of exposure to environmental education as a child and what are the top sources of current exposure as adults. This may provide useful information for organizations as they consider where to focus their EE outreach. Second, by totaling the responses to exposure frequencies, we hope to establish a scale for the amount of exposure each respondent had as a young person and as an adult. This scale could then

be used to see if there are correlations between exposure levels and age, gender, community involvement, and levels of concern about the environment.

Definition:

***Environmental education** is life-long learning that aims to increase people’s knowledge and awareness about the environment, to provide people with the necessary skills and expertise to make informed environmental decisions, and to live responsibly in the world.*

At the top of page two of the survey, a definition of EE was provided to inform the respondent that the survey’s scope included but was not limited to public school education. This definition, created by the design team, was a modified version of the Bill Stapp definition as seen on page 3 (Stapp, 1969). It incorporates the latest national and internationally accepted definition of EE. We attempted to write as “user-friendly” a definition as we could. It was placed on the second page so that respondents could fill out the questions on the first page without being influenced by the definition. At this point in the survey, we wanted to begin assessing respondents’ opinions about EE. We suspected that many respondents might be unfamiliar with the term EE, but given the questions on page one and this definition, they would be able to offer opinions about it.

5. Indicate ***how important*** the role of environmental education is in helping to meet the following needs of society today and in the future:

Circle the number that reflects your opinion.

	Not Important			Not Sure			Very Important
	1	2	3	4	5	6	7
a. Helps preserve living things.....	1	2	3	4	5	6	7

Question 5 (a) was framed in simple language to see if people recognize the role EE plays in the conservation of biodiversity. The term "biodiversity" was not used because according to a poll done by Belden, Russonello and Stewart in 2002, 68% of respondents in a nationwide survey were not familiar with this term (The Biodiversity Project, 2002).

5. Indicate <i>how important</i> the role of environmental education is in helping to meet the following needs of society today and in the future: <i>Circle the number that reflects your opinion.</i>							
	<u>Not</u> Important			<u>Not</u> Sure		<u>Very</u> Important	
b. Helps maintain a healthy environment for people to live in.....	1	2	3	4	5	6	7
d. Helps promote long-term sustained use of natural resources.....	1	2	3	4	5	6	7
e. Helps prevent expensive environmental problems in the future.....	1	2	3	4	5	6	7
f. Helps prepare young people and people in the work-force to address complex environmental problems.....	1	2	3	4	5	6	7

Questions 5 b, d, e and f were based on the desire to test the EE messages promoted by the Office of Environmental Education under the Environmental Protection Agency (EPA) that were published by the National Environmental Education Advisory Council in 1996. These messages were value statements created by the Executive Director of the North American Association of Environmental Education (NAAEE), Ed McCrea, in 1993 and “neatly straddle the preservation-utilitarian dichotomy” (Disinger, 1997 p. 29). These five claims state that EE helps ensure the health and welfare of our

nation by protecting human health, advancing quality education, creating jobs in the environmental field, promoting environmental protection along with economic development, and encouraging stewardship of natural resources (EPA, 1999). The word “stewardship” was dropped because of its religious connotations, which we thought could cause some mixed results. The fifth message, “EE advances quality education,” was placed in Question 8, which discussed the role of EE in helping the needs of children and young people today.

<p>5. Indicate <i>how important</i> the role of environmental education is in helping to meet the following needs of society today and in the future: <i>Circle the number that reflects your opinion.</i></p>							
	Not <u>Important</u>			Not Sure		Very Important	
c. Helps preserve the beauty of nature and scenery.....	1	2	3	4	5	6	7

The final message tested in Question 5 was “EE helps preserve the beauty of nature and scenery.” The idea for this question came from a poll undertaken by the Biodiversity Project in 2002. It related to Audubon’s longstanding interest in educating the public about nature and natural history. This question looked at the importance of the intrinsic nature for its beauty and not for utilitarian purposes. We wanted to see how people view the role of EE in helping to protect nature.

6. Please tell us the extent to which you *agree or disagree* with these claims about environmental education (EE).

Circle the number that reflects your opinion.

	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree		
b) EE teaches students to view humans as destructive to the earth.....	1	2	3	4	5	6	7
d) EE has no place in public school education..	1	2	3	4	5	6	7
e) EE needs to stay away from controversial issues.....	1	2	3	4	5	6	7
g) EE makes learners unduly worried about environmental problems.....	1	2	3	4	5	6	7
j) EE preaches environmental activism.....	1	2	3	4	5	6	7
l) EE is <u>not</u> urgently needed now.....	1	2	3	4	5	6	7

The 13 messages tested in Question 6 asked to what extent the respondents agreed or disagreed with claims about EE. The claims were a mixture of both positive and negative messages about EE. The purpose of the negative claims was to create a balance in the survey between claims favorable and unfavorable to EE. We also wanted to test claims negative to EE that have been put forward by EE critics; we wanted to ascertain how wide the public support is for these negative claims.

One of the early critiques of EE was that too much “gloom and doom” may have been presented by some teachers to beginning elementary school students and prompted the formulation of the question 6(b) and (g) above. Nancy Bray Cardozo wrote an editorial published in *Audubon* magazine (1994) in response to her six year old daughter’s comments about being upset about sleeping in her “dead tree bed” after eating “killed peas” for dinner. Cardozo believes that her daughter received negative views of about humans from the environmental education she received at school. Cardozo wanted

children to be taught how things are connected, about the food web, predation, the cycling of nutrients, etc. during early elementary school years. She preferred to have extinction, vanishing rain forests, and ruined waterways explained with an economic perspective. Cardozo felt that children were being taught that humans were intruders in nature and that it is more important that EE teaches that we must work to save ourselves rather than to save the earth since the earth will still be around long after we are all extinct. In a different critique by another individual outside of the EE profession, Jonathan Adler wrote that children were being scared into environmental behavior (1993). Because of these critiques about EE, we wanted to know if the “gloom and doom” view of EE has widespread agreement or not among the general public.

Claim 6 (d) was added to measure the strength of support for or against EE in the public schools. Since EE occurs both in public schools and in other venues, we wanted to know what our respondents might be thinking just about EE in public schools.

We were curious if respondents might have any concerns about discussing controversial issues while they learned about the environment. The purpose of EE as determined in Tbilisi in 1977 is to learn how to think critically in order to solve environmental problems. We wanted to see if respondents agree or not with the fundamental purpose of EE.

Claim 6(j) initially read that EE preaches environmental “extremism.” During our second pilot testing of this question, a quarter of the respondents asked what we meant by extremism. We realized after some deliberation that some of the critiques of EE were that EE teaches activism, not extremism, so we changed the wording to reflect this. The use of the word “preaches” in the claim was to provide a negative slant to the question.

Finally Claim 6(l), “EE is not urgently needed now,” was made to gauge how pressing respondents believe the current need for EE is.

6. Please tell us the extent to which you <i>agree or disagree</i> with these claims about environmental education (EE).							
Circle the number that reflects your opinion.							
	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree		
a) EE is the best investment because it costs less to prevent environmental problems than to clean them	1	2	3	4	5	6	7

The State of Kentucky’s EE Master Plan emphasizes the economic benefits of EE regarding pollution prevention (KEEC, 1998). Leaders in Kentucky believe that EE will save their state millions of dollars in clean up of waterways, roads, and illegal dumps, and they are committing significant resources to make this happen. For this question, however, we were curious to see in Question 6(a) if a certain level of education is necessary in order to understand the possible cost savings of EE.

6. Please tell us the extent to which you <i>agree or disagree</i> with these claims about environmental education (EE).							
Circle the number that reflects your opinion.							
	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree		
f) EE should be a central goal in public school education.....	1	2	3	4	5	6	7

Question 6(f) attempted to find out if people value EE enough to place it squarely in the core curriculum of public education. We felt this was a difficult question because EE is a new concept for many people. Many types of education attempt social betterment

and are competing for recognition in the public school education, e.g., alcohol and drug abuse education, sex education, etc. Question 6(f) addresses very complex issues and could obviously develop into a separate survey topic.

<p>6. Please tell us the extent to which you <i>agree or disagree</i> with these claims about environmental education (EE).</p> <p><i>Circle the number that reflects your opinion.</i></p>						
	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree	
c) EE shows learners that they should play a positive role in the care of the environment.....	1	2	3	4	5	6 7

Question 6(c) attempted to see if people believe that EE has a role in helping people see that their individual actions make a difference when caring for the environment (Hart, 1997).

<p>6. Please tell us the extent to which you <i>agree or disagree</i> with these claims about environmental education (EE).</p> <p><i>Circle the number that reflects your opinion.</i></p>						
	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree	
h) EE can help people make the connection between a healthy environment and human health.....	1	2	3	4	5	6 7

Question 6(h) was slightly different than Question 5(b), which asked to rate the importance of “EE helping to maintain a healthy environment for people to live.” This question investigated whether respondents agree that EE is able to link environmental health to human health issues.

6. Please tell us the extent to which you ***agree or disagree*** with these claims about environmental education (EE).

Circle the number that reflects your opinion.

	Strongly <u>Disagree</u>	Disagree	Not Sure	Agree	Strongly <u>Agree</u>		
i) EE is essential for preparing learners for jobs later in life.....	1	2	3	4	5	6	7

The purpose of Question 6(i) related to EPA language about the workforce. It attempted to ascertain whether respondents recognize the importance of EE in preparing for the future work force.

6. Please tell us the extent to which you ***agree or disagree*** with these claims about environmental education (EE).

Circle the number that reflects your opinion.

	Strongly <u>Disagree</u>	Disagree	Not Sure	Agree	Strongly <u>Agree</u>		
k) EE challenges learners to understand different perspectives on complex issues.....	1	2	3	4	5	6	7

The teaching of critical thinking skills is considered one of the strengths of EE and is an area that has been neglected in current K-12 and many college and university teaching methodologies (Gardiner, 1994; Kurfiss, 1988). To think critically a student must look at a variety of viewpoints, consider the arguments, discuss the alternatives and create solutions (Hungerford et al., 1980; Stapp and Wals, 1992). Since “critical thinking skills” could be construed as education jargon, we phrased this question to be more readily understandable to those outside of the field of education.

6. Please tell us the extent to which you *agree or disagree* with these claims about environmental education (EE).

Circle the number that reflects your opinion.

	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
--	----------------------	----------	-------------	-------	-------------------

m) National, state and local governments should support and fund EE programs.....	1	2	3	4	5	6	7
---	---	---	---	---	---	---	---

Since limited funding is considered one of the barriers to more widespread teaching of EE, Question 6(m) wanted to know if respondents support government funding for EE. In the Roper/NEETF National Report Card on Environmental Knowledge, Attitudes and Behaviors Report of 2001, 86% of respondents agreed that government agencies should support environmental programs for adults. In this same study 82% agreed that private companies should train their employees to solve environmental problems. The question posed in this study was more specific in that it wanted to know if respondents support government *funding* of EE programs. Question 6(m) did not specify if it were for adults or children.

7. How concerned are you about the state of our environment today...

	Very Unconcerned	Unconcerned	Neutral	Concerned	Very Concerned
--	---------------------	-------------	---------	-----------	-------------------

a. in the world?.....	1	2	3	4	5	6	7
b. in the United States?.....	1	2	3	4	5	6	7
c. in Washington State?.....	1	2	3	4	5	6	7
d. in your community?.....	1	2	3	4	5	6	7

Kevin Coyle of the National Environmental Education and Training Foundation recommended Question 7. In other surveys, results have shown that people tend to view the rest of the world as more polluted than their local community (Coyle, personal

communication, April 10, 2004). This series of questions attempts to validate those results. Having a measure of level of concern also provides an interesting factor to see if there are correlations with this and other variables in the survey.

8. Indicate how important the role of environmental education is in helping to meet the following needs of children/young people today?

Circle the number that reflects your opinion.

	Not <u>Important</u>				Not Sure			Very <u>Important</u>
a. Helps students perform better in school.....	1	2	3	4	5	6	7	

The next set of questions asks respondents' opinions about how important they see EE is in helping to meet the needs of young people today. Question 8(a) is the fifth EPA claim to be tested, which states that EE advances academic performance. Instead of "advancing academic performance" this message was reworded to say, "EE helps students perform better in school." This message has been tested in numerous teacher surveys and is strongly supported by those teachers who implement EE in the classroom (NEETF, 2000; Kearney, 1999; SEER, 1998; NAAEE, 2000; Hart, 2003; Angell, 2002; Ballantyne et al., 2000; and Bartosh, 2002). In many teacher surveys, teachers agree that EE makes the learning relevant and dramatically increases students' interest, involvement and performance. We hoped this question would unveil how familiar the public is with this information.

8. Indicate how important the role of environmental education is in helping to meet the following needs of children/young people today?

Circle the number that reflects your opinion.

	Not Important			Not Sure			Very Important
c. Helps young people feel connected to their community through service projects.....	1	2	3	4	5	6	7
d. Helps connect young people with nature.....	1	2	3	4	5	6	7

The National Audubon Society has chapters and a growing network of Audubon Centers throughout the United States, which bring adults and youth together as volunteers to learn about birds and the natural world, build and monitor birdhouses, plant trees and shrubs for wildlife and habitat enhancement, and clear invasive plants along with many other community service projects. They believe these projects help young people build connections to their community and to nature, and they want to know if the public also makes this connection in Question 8(c). Environmental educator David Sobel also makes a compelling argument for service work for children beginning in adolescence. Sobel believes that service work will show students the relevancy of what they study in school (1996).

8. Indicate how important the role of environmental education is in helping to meet the following needs of children/young people today?

Circle the number that reflects your opinion.

	Not Important			Not Sure			Very Important
e. Helps young people learn to take care of themselves in the outdoors.....	1	2	3	4	5	6	7

In our initial pilot testing of the survey a citizen who grew up in rural Washington pointed out that we had missed a key reason for EE for people in her hometown, that EE

helps young people learn to take care of themselves in the outdoors. We thought this was an interesting and valid addition to the survey, and used her exact wording.

8. Indicate how important the role of environmental education is in helping to meet the following needs of children/young people today? <i>Circle the number that reflects your opinion.</i>							
	Not <u>Important</u>		Not Sure		Very <u>Important</u>		
b. Helps prepare young people to make informed decisions as consumers.....	1	2	3	4	5	6	7
f. Helps prepare young people to make informed decisions when they become voters.....	1	2	3	4	5	6	7

The two claims, 8(b) and (f), “EE helps prepare young people make more informed decisions as consumers” and “EE helps prepare young people to make informed decisions when they become voters” are based on the premise that EE teaches personal responsibility (Stapp, 1969; Hungerford et al., 1980; and Roth, 1992). Because EE emphasizes the value of “critical thinking skills”, it teaches children how to think through the consequences of their behaviors.

9. Are you aware of the Washington State law requiring EE as a part of all basic subject matter K-12 (WAC 180-50-115) in the public schools? a. Yes b. No
--

Question 9 has appeared in two teacher surveys and it has been shown that not all teachers in the state of Washington are aware of this mandate (Angell et al., 2002; Kearney, 1999). We thought this would make an interesting comparison between teacher and public awareness of this mandate.

Finally, we would like to ask you a few short background questions about yourself.

Please circle the appropriate responses.

10. I am a. Female b. Male

11. How old are you?

- a) 65 and older
- b) 55 to 64
- c) 45 to 54
- d) 35 to 44
- e) 25 to 34
- f) 18 to 24

12. Please describe your occupation:

13. Please indicate the highest level of education you have completed.

- a) High School
- b) Some College Courses
- c) 4-Year College Degree
- d) Graduate School

14. Are you parent or grandparent of a child under the age of 19?

- 1) parent
- 2) grandparent
- 3) neither

14a. Please circle the age group(s) of those children:

- a) 0-4 years c) 9-12 years
- b) 5-8 years d) 13-18 years

15. How would you describe your political views?

- a) Conservative
- b) Moderate
- c) Liberal
- d) Independent

16. Would you describe the area you live in as:

- a) Urban
- b) Suburban
- c) Small Town
- d) Rural

17. How would you rate your level of community involvement? (i.e. voting, volunteering, church involvement, neighborhood association, etc.)

Not						Very
Active						Active
1	2	3	4	5	6	7

This last set of questions asked respondents to provide us with demographic information. These were our independent variables and included gender, age, occupation, level of education completed, parent or grandparent, age of children or grandchildren, description of area of residence, and self-assessments of political views and level of community involvement. Income was not included as an independent variable because each environmental learning center (ELC) in this study charged an entrance fee, which would preclude some middle and most low-income respondents; thus it was decided that a broad range of income would not be represented in this sample. The question regarding age of children or grandchildren was to provide feedback to the environmental learning centers and was not a point of interest for this study.

18. Do you have any other thoughts or recommendations regarding environmental education in your community, WA or beyond? a. Yes b. No

Please explain:

In Question 18 respondents were provided with an opportunity to include at the end, any other thoughts they might have about EE.

Research Methods

1.) The data were collected as part of a statewide written survey of visitors to Environmental Learning Centers (ELCs) in the state of Washington. The survey was a written questionnaire whose respondents were asked to circle the answer that best reflected their opinion. It consisted of 32 attitude questions, six knowledge questions, 44 questions regarding the frequency of exposure to environmental education and 10

demographic questions. The survey generally took between seven to 10 minutes to complete.

2.) Two pilot tests were conducted of this survey. The first pilot test was given to Jean MacGregor's EE class at The Evergreen State College. This class of 18 provided excellent feedback. The second pilot test was administered at the Olympia Food Cooperative in Olympia. Twenty respondents participated in the second pilot test. The second site was chosen based on the willingness of the store manager to allow the survey to be administered on its premises.

3.) Environmental Learning Centers were chosen as sites for the survey for three reasons. First, ELCs were a perfect fit for Audubon Washington from the strategic social marketing approach. This was Audubon's first study of ELC visitor attitudes since the National Audubon Society made a major national commitment to building Audubon Centers in Washington and throughout the country. The ELC survey sites included Woodland Park Zoo, Seattle Aquarium, Point Defiance Zoo, Northwest Trek, The Port Townsend Marine Science Center, Wolf Haven International, and Cat Tales Zoological Park, all environmental learning centers in Washington open to the general public.

Second, ELCs were targeted because of the likelihood that visitors to these centers would be generally supportive of the concepts within the study. Using a targeted population is the best way to test a survey before launching into the much more ambitious random study. In this case, if the "ELC visitor community" were highly supportive of EE, then expanding the study to the population as a whole would provide important comparison data. Third, the ELC professional community was most likely to support a survey on EE on their premises because EE comprises a large part of these centers' work.

In addition, there were two constraints that substantiated the selection of visitors to ELCs for this survey. First, the amount of time to gather data was quite limited. There were only two months allowed to administer the survey. The research project, which began in November 2003, needed to be completed by June 2004.

Second, limited resources were available for this survey. Audubon Washington supported project development, paid the expenses for copying, travel to research sites, small gifts for the respondents, and co-coordinated testing at each of the ELCs. Insufficient funds were available to support a large random study or for professionals to conduct and analyze the survey.

4.) As noted above, this study was commissioned by the Washington State Office of the National Audubon Society, which provided staff support and project coordination, survey printing costs, SPSS software for statistical analysis of the data, travel expenses, and gifts for survey respondents. The national office generously provided the lithium battery-powered flashlights. Respondents were provided with a clipboard, pencil, survey and a place to sit. Upon completion of the survey, respondents were offered a choice of gifts for their time. The gifts ranged from Audubon Birding Trail Maps of the Cascade Loop and the Coulee Corridor Scenic Byway, small key-chain flashlights with batteries, 100% organic cotton t-shirts, to stickers to provide a distraction for children of respondents. Woodland Park Zoo and Point Defiance Zoo provided some gifts as well in the form of stickers and pencil packs.

5.) The survey was conducted by census, meaning every adult who entered the ELC facilities during the time the survey was conducted was asked if they would be interested in taking five minutes to fill out a survey in exchange for a free gift. These surveys were

administered between March 13th and April 24th of 2004. Because of the restricted timeline, respondent goal of 1000, and because ELCs reported the highest number of visitors on the weekends, all surveying of ELCs was conducted on the weekends. A sample of 1165 individuals over the age of 18 completed the survey in all; 1002 were from the ELCs.

6.) Volunteers assisted in survey administration and their numbers at each site were determined based on the number of visitors predicted for the weekend by each ELC contact person. Six volunteers were on hand for Woodland Park Zoo, four for Seattle Aquarium, four for Point Defiance Zoo, and two for each of the other sites. Surveyors included Audubon Washington Field Director Heath Packard, volunteers from Audubon Washington and myself. Five volunteers from the Spokane Audubon chapter conducted the survey over two weekends at Cat Tales, which is approximately 20 miles north of Spokane. The Centralia Post Office was the only site surveyed during the week because of the probability of attaining more respondents.

7. Two locations were chosen as comparisons for this survey. First, a post office in Centralia, Washington was selected. Centralia is small town within a conservative rural community in Lewis County, situated halfway between Seattle and Portland. Centralia's population was 14,742 in the 2000 census (U.S. Census, 2000). Its economic basis is largely agriculture and forestry. The unemployment rate for Lewis County is 8.0% for March 2004 compared to 6.5% state level for the same time period (NAAF, 2004). See Table 2. This site was thought to be more conservative and we thought respondents' opinions might provide an interesting comparison to the predominantly politically liberal population that resides in the more urban and suburban communities around the Puget

Sound Basin. “Liberal” in this context refers to those most likely to vote Democratic in the next election. In Lewis County where Centralia is located, residents have voted Republican in all general elections at least since 1972 (Secretary of State Records, 2004). Residents of Jefferson, King, Pierce, and Thurston Counties, where all other ELCs except Cat Tales in Spokane are located, have voted Democratic in the past four general elections. It was determined that more visitors to the post-office would occur on a weekday, so this was the only site visited during the week.

Table 3.1. Unemployment and Poverty Rates for Counties of Environmental Learning Centers: March 2004

County	ELCs	Unemployment Rate	Poverty Rate
King	Woodland Park Zoo Seattle Aquarium	5.5 %	8.4 %
Lewis	Centralia Post Office	8.0 %	14.0 %
Jefferson	Port Townsend Marine Science Center	4.9 %	11.3%
Pierce	Point Defiance Zoo & NW Trek	6.7 %	10.5 %
Spokane	Cat Tales	6.1 %	12.3 %
Thurston	Wolf Haven	6.5 %	4.9 %

(NWAFF, 2004)

The second comparison group selected consisted of attendees at the Environmental Education Association of Washington (EEAW) conference, whose annual meeting was held during the period of time in which the surveys were conducted. The EEAW conference was an assemblage of professionals who work in the field of EE.

Hypotheses

Twelve hypotheses were tested in this study. These were chosen based on my intellectual curiosity, Audubon Washington's interest in market testing certain questions, and the knowledge that there is a dearth of literature regarding public perceptions of EE. There are many more hypotheses relevant to the data collected than can be reported on in this thesis. It is our hope that others will use this data to analyze and report on hypotheses that they believe will provide interesting and useful information to them.

Hypothesis 1: There is a significant difference in awareness of EE based on where people live.

This question will let us know if EE is reaching small and large communities equally. If there were a big difference in awareness, it would be useful to look at correlations between areas of residence and other questions.

Hypothesis 2: There is a positive correlation between the levels of exposure to EE and degrees of concern about the state of the world, the U.S., WA State, and local communities.

The thinking is that greater exposure to EE as a youth and as an adult will lead to higher degrees of concern today about environmental quality. Intuitively it would seem that greater exposure would be strongly correlated with degree of environmental concern. If not, the level of concern may instead be associated with different factors.

Hypothesis 3: Higher levels of education can be correlated with the statement that “It costs less to prevent environmental problems than to clean them up.”

We were curious to see if higher levels of education correlate with support for the idea that there are costs savings in preventing environmental problems.

Hypothesis 4: There is a significant difference between occupation and whether or not people support the statement “EE should be a central goal in public school education.”

If there are significant differences in the responses by occupation, we were curious to discover what types of occupations correlated with having EE as a central goal in public school education and which did not. For example, the data might show that people whose occupation involves natural resource extraction might feel that EE threatens their livelihood and would not be amenable to EE becoming a central goal in public education. On the other hand it may be that those involved in resource extraction are equally concerned about learning how to live sustainably and support EE as a central goal in public school education.

Hypothesis 5: There is a significant difference in how people view themselves politically and their response to the statement “National, state and local governments should support and fund EE programs.”

We presumed that political views might account for differences in support for the public funding of EE, with respondents describing themselves as conservatives being less supportive than those describing themselves as liberals. An analysis of this hypothesis will help settle this claim.

Hypothesis 6: There is a significant difference in response to “EE is not urgently needed now” by people who live in different areas.

Our supposition is that environmental concerns often seem more pressing in areas of denser population. We were interested to see if people who live in rural areas and small towns feel the same level of urgency as urban and suburban respondents.

Hypothesis 7: There is a significant difference in level of community involvement and support for the statement, “EE helps young people feel connected to their community through service projects.”

Our assumption here is that adults who are actively engaged in their communities tend to feel more connected to their communities. If this is true, then it is likely that they will think that EE helps young people feel connected to their communities through community service projects as well.

Hypothesis 8: There is a significant difference in age and levels of concern about the world, the U.S., and state and local communities.

We were aware that older people might show less concern for environmental quality because in previous surveys age gaps persist in issues related to the environment (Roper/NEETF, 1992 through 2001). In the NEETF/Roper Poll of 2000, 51% of the youngest age group (age 18-34) believes that laws protecting the environment have not gone far enough compared to 38% of those 65 and over. In this same study, 75% of the

youngest age group favored the environment over the economy when forced to choose, compared to 68% of those 65 and older. In this survey, we wanted to see if we would see similar levels of concern about the environment between younger and older respondents.

Hypothesis 9: There are significant differences between gender and support for the statement: EE challenges learners to understand different perspectives on complex issues.

Just as in the previous hypothesis the Roper/NEETF Poll has found differences in gender and responses to a variety of environmental issues. Eight percent more women than men prefer environmental protection to economic development when forced to choose between the two (1992-2001). We thought it would be interesting to see if there are gender differences regarding the value of critical thinking.

Hypothesis 10: There is a significant difference between occupations and support for the role of EE in “Helping to maintain a healthy environment for people to live.”

We thought this would be interesting to look at differences between occupation and perspectives on the role of EE in helping to maintain a healthy environment. For example, are health care professionals more likely to see this link?

Hypothesis 11: There is a significant difference between level of exposure to nature centers and level of community involvement.

The National Audubon Society has ambitious plans to build Audubon Centers throughout the U.S. and Washington and would like to know if there is a correlation between exposure to nature centers and community involvement.

Hypothesis 12: There is no significant difference between people of different political persuasions and support for the idea that EE connects children with nature.

We think that people of all political persuasions will agree with the idea that EE connects children with nature, so we were to curious to test that assumption.

Survey Limitations

- This survey was conducted under serious time constraints. The survey would have benefited by a third pilot test after changes were made in the wording of several questions as a result of the second pilot test.
- Surveys were conducted only on the weekends, which left out adults who could only visit ELCs on weekdays.
- Budget constraints did not allow for a random survey designed and administered by professional social marketers nor professional analysis of survey data.
- By conducting the surveys at ELCs, diversity was limited. Each ELC charged admission, which probably restricted some middle and most low-income adults from the survey pool. There was no time to have a translation of the survey into Spanish or other languages, which would have provided some perspectives from culturally diverse respondents.

Spanish is the most commonly spoken foreign language in the area (U.S. Census, 2000).

- This survey was also somewhat self-selecting because when a potential respondent wanted to know what the survey was about, he/she often elected not to take it. Reasons cited included “subject does not sound interesting” and “opposed to the concept of EE.” We did not keep track of how many times this happened. It most likely occurred less than 50 times for all locations combined.

Statistical Tools

The data collected in this survey is either ranked or nominal data. Chi-square along with Cramer’s V tests were used to evaluate the nominal data, and Spearman’s rho test was used to evaluate the ranked data. These tests are commonly used to evaluate this type of data. Not only did these tests tell if the results are significant but they also provided an indication as to the strength of the results.

CHAPTER 4

Analysis

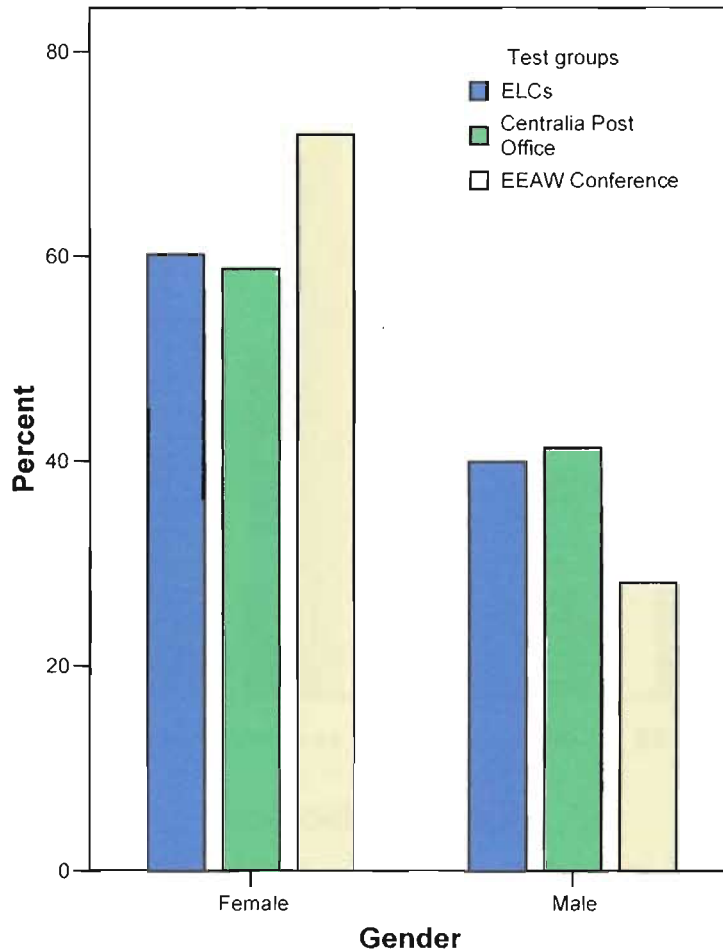
The analysis of the data is organized in four parts. First is information about demographic data. Second is a descriptive analysis of the responses given by respondents at the Environmental Learning Centers (ELCs). Third is a comparison of the results from the three respondent groups: the ELCs, the Centralia Post Office (CPO), and the Environmental Education Association of Washington (EEAW) conference attendees. As in Chapter 3, the analysis for parts two and three of this chapter will follow the order of the questions in the survey. The fourth part of the analysis includes a statistical analysis of each of the hypotheses posed in Chapter 3.

The data found in this survey are either ranked or nominal, and results from each question in the ranked categories were not normally distributed. Nominal data answer questions with yes/no, female/male type of responses. Ranked data are responses that are measured on scales such as from one to seven as in this survey with “1” being strongly disagree to “7” being strongly agree. The data were not normally distributed: they were skewed in each case in support of EE. Because of this, nonparametric tests had to be employed in order to produce a valid analysis. The best choice for a nonparametric test for ranked data is Spearman’s rho with two-tailed significance, and for the nominal data, chi-square. In some cases, data was collapsed into fewer categories in order to use the chi-square test. Cramer’s V is a post-test for chi-square that provides an indication of the strength of the differences in responses.

Demographic Analysis

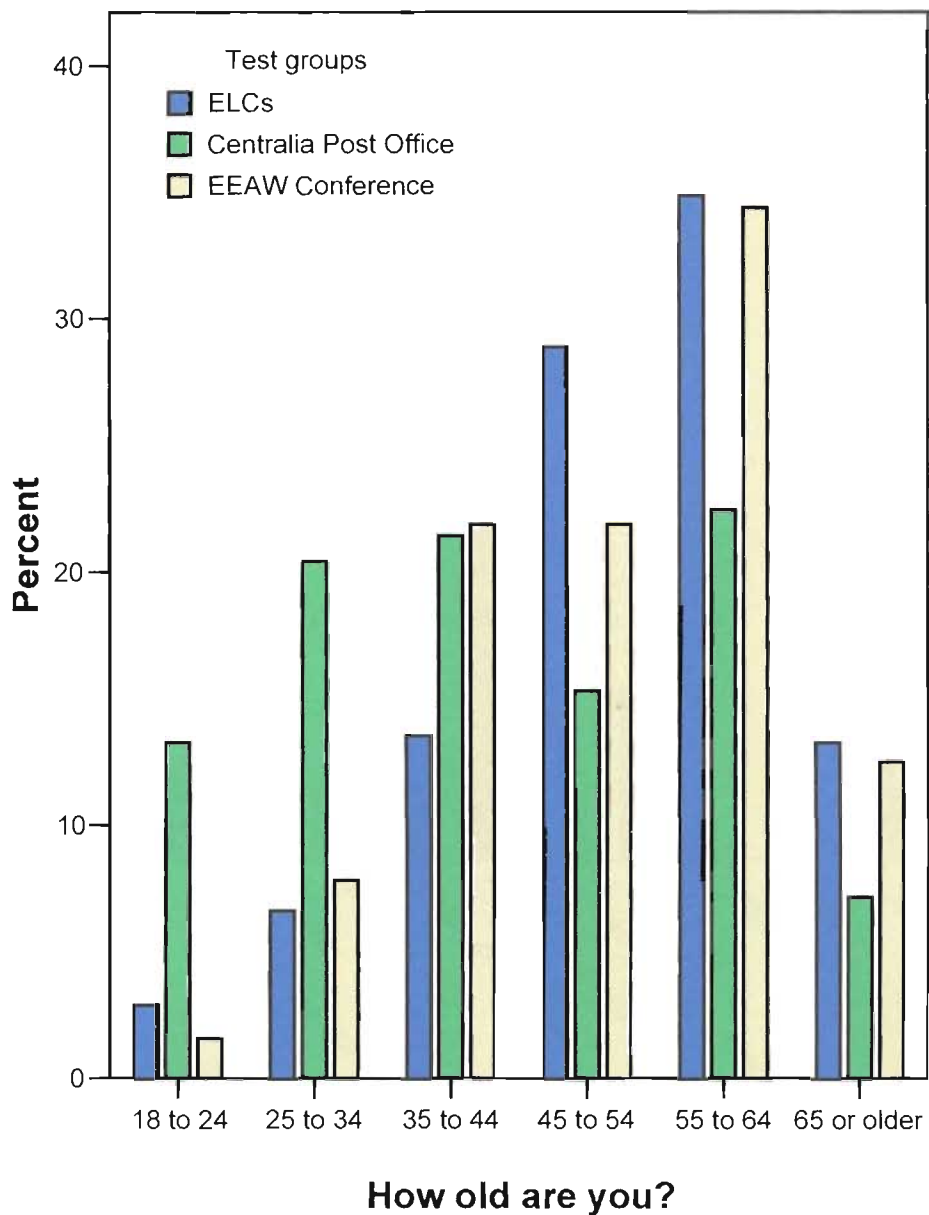
An analysis of the demographic variables will provide some description as to who took part in this survey. Question 14, which asks about the age groups of respondents' children/grandchildren, is not included.

Figure 4.1.1. Gender of Respondents of the Three Test Groups



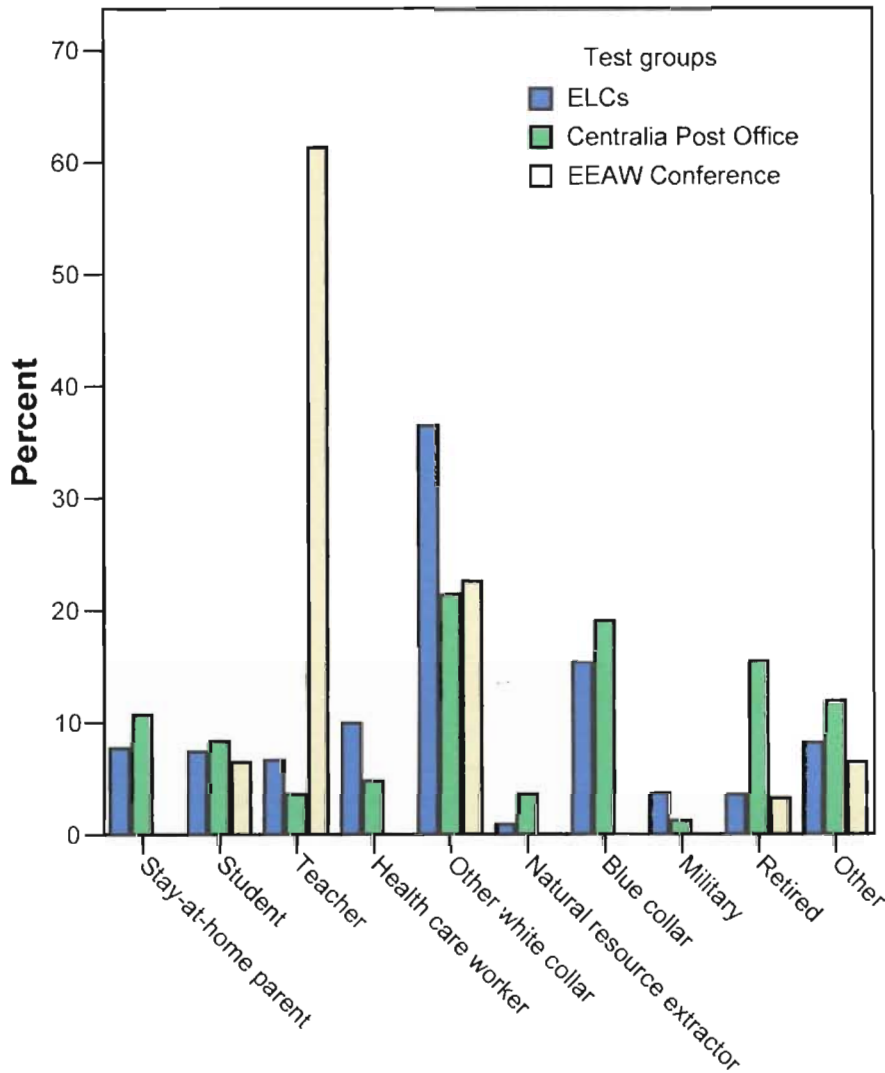
As Figure 4.1.1 indicates, more females than males agreed to fill out the survey in each of the three groups surveyed. It is not known why more females agreed to take the survey than males. It is possible that more females visited each of the sites surveyed.

Figure 4.1.2. Age Group of Respondents of the Three Test Groups



As Figure 4.1.2 reveals, at the ELCs, respondents from the age of 45 to 64 were in the majority. The Centralia Post Office was fairly evenly distributed over the six age groups. Respondents from the EEAW tended to be between the ages of 35 and 64 with the 55 to 64 age group in the majority.

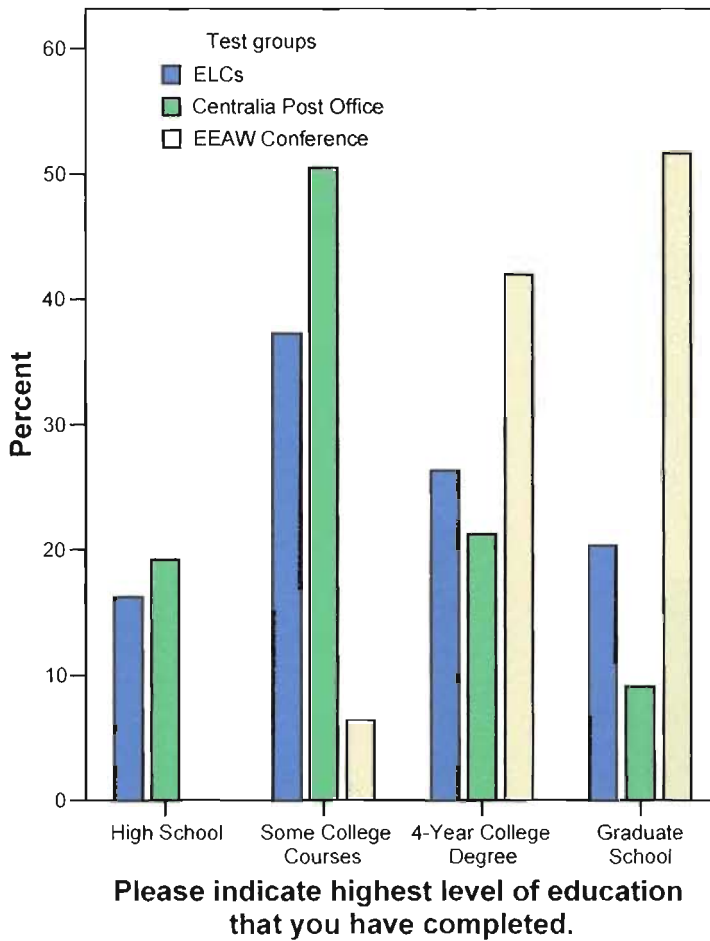
Figure 4.1.3. Occupation of Respondents of the Three Test Groups



Please describe your occupation.

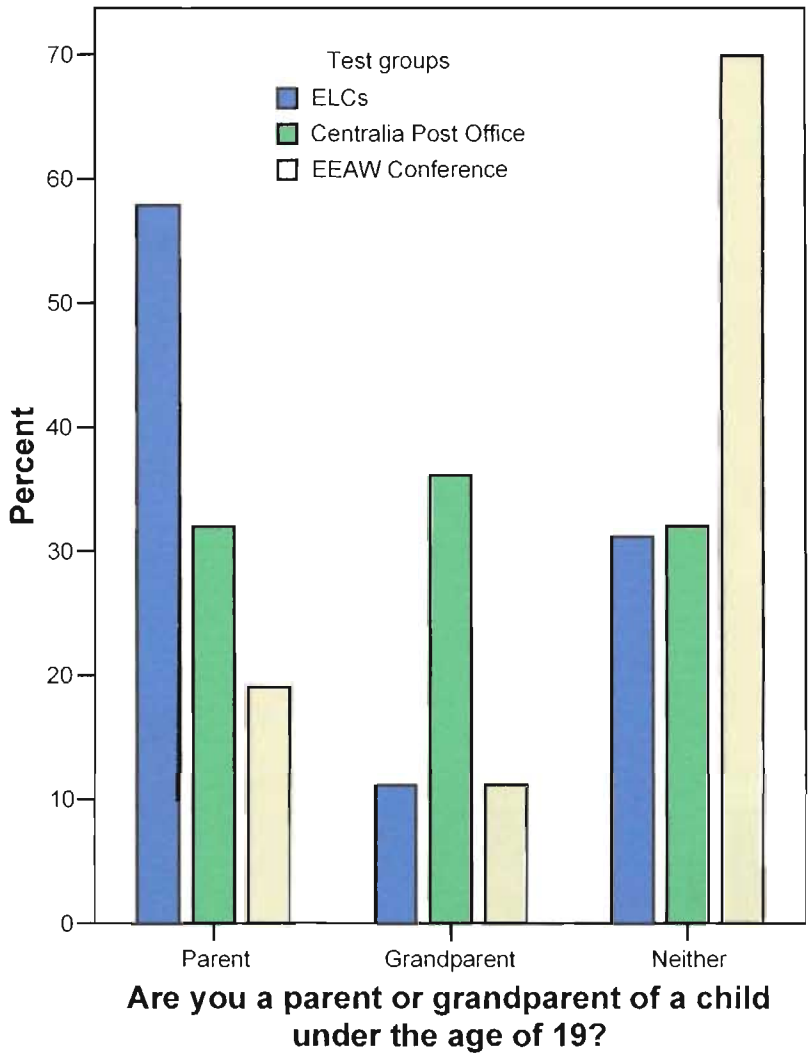
As shown in Figure 4.1.3, respondents from the ELC group were primarily white-collar and blue-collar workers, while respondents from the Centralia Post Office were primarily white-collar, blue-collar and retired workers. The EEAW Conference attendees were, as expected, predominately educators along with other white-collar workers.

Figure 4.1.4. Level of Education of Respondents of the Three Test Groups



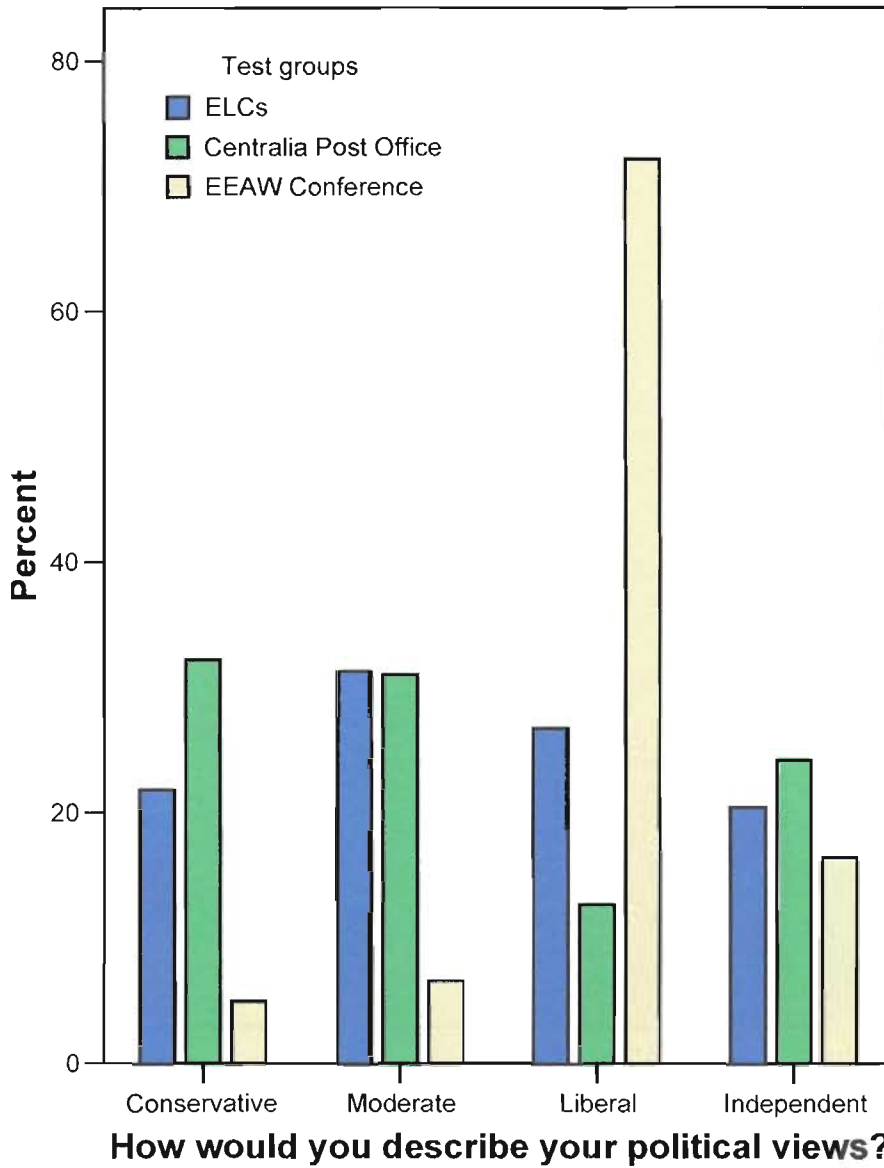
The distribution of respondents across the education gradient varied considerably for the three groups. As Figure 4.1.4 displays, while respondents with some college courses were in the majority for the ELC group and the CPO group, only six percent of the respondents from the EEAW belonged to this group. Respondents from the EEAW conference had the highest level of education overall with 52% having a graduate degree and an additional 42% having a college degree. There were no respondents from the conference having less than some college classes. There were a few more respondents with graduate degrees visiting the ELCs than those visiting the Centralia Post Office.

Figure 4.1.5. Parent/Grandparent Status of the Three Test Groups



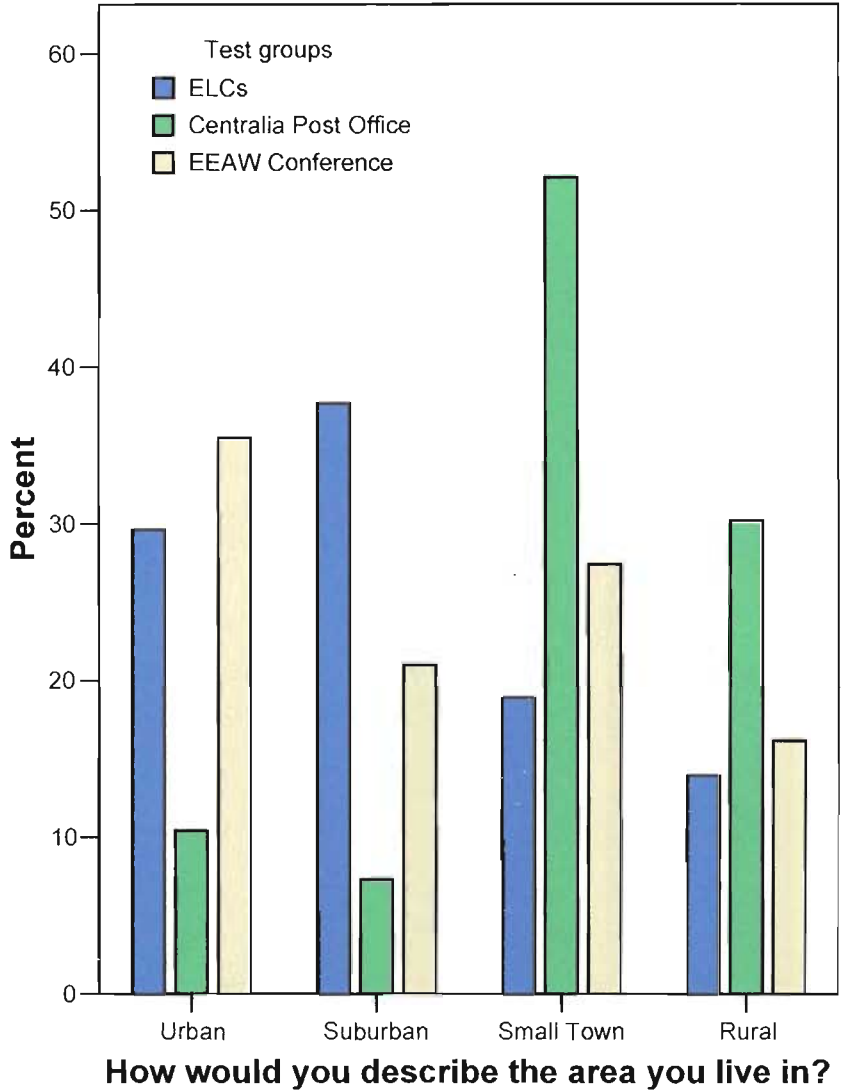
As Figure 4.1.5 indicates, there was a much larger number of parents having children under the age of 19 attending the ELCs than visiting the Centralia Post Office or the EEAW conference. Respondents from the Centralia Post Office had the largest number of grandparents. In contrast, the EEAW Conference group had the greatest number of respondents with no children.

Figure 4.1.6. Political Views of Respondents of the Three Test Groups



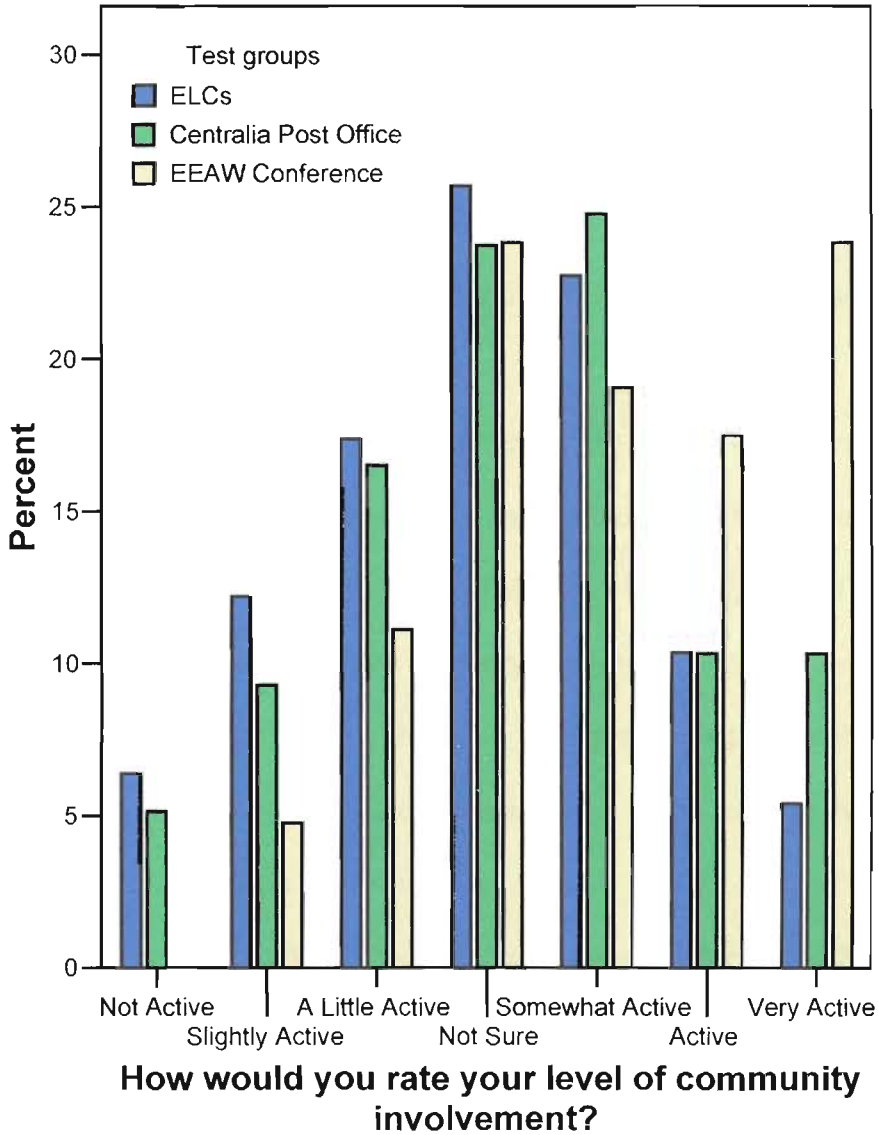
As Figure 4.1.6 displays, respondents from the ELCs were mostly moderates and liberals, while respondents from CPO were moderates and conservatives. Respondents from the EEAW Conference were predominantly liberals.

Figure 4.1.7. Area of Residence of Respondents of the Three Test Groups



As Figure 4.1.7 indicates, most people attending the ELCs reported that they were from urban and suburban areas while those who visited the CPO reported being small town and rural dwellers. Respondents from the EEAW Conference were more often from urban areas and small towns.

Figure 4.1.8. Level of Community Involvement of Respondents of the Three Test Groups



As indicated in Figure 4.1.8, distributions of reported levels of community involvement were very similar between the ELC and the CPO groups. The distribution of the EEAW Conference attendees was skewed towards the active side.

Summary of the Demographic Analysis

The ELC respondents had 26% college graduates with an additional 20% having a graduate degree; 60% were female, and 54% were white-collar workers. Fifty-eight percent of the visitors to the ELCs were parents, with 11% as grandparents. ELC respondents had higher percentages of moderates and liberals in their composition, and they reported living in predominately urban and suburban areas. Visitors to the ELCs were close to the same ages as the attendees to the EEAW Conference. The most common age group of the visitor was from 55-64 with the 45-54 year olds following close behind.

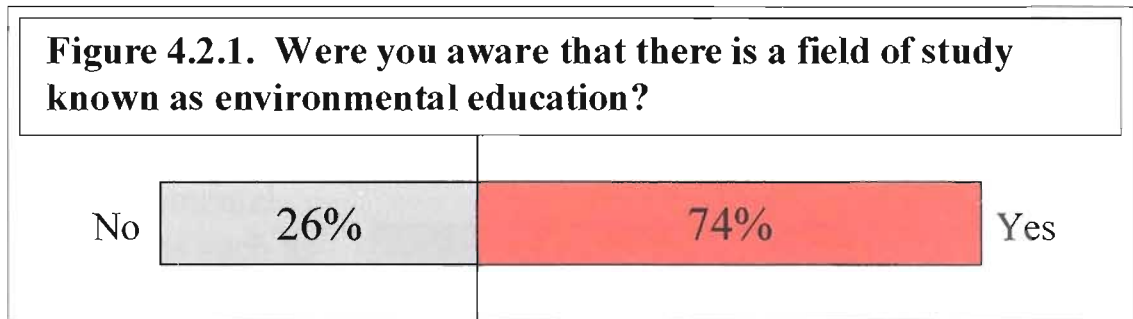
The Centralia Post Office respondents had 21% college graduates and 9% with a graduate degree. Respondents were 59% female with 30% white-collar workers, 15% blue-collar workers and 15% retired. Thirty-two percent viewed themselves as conservatives with additional 31% as moderates. Only 13% of the visitors considered themselves liberal. People visiting the CPO were predominately small town dwellers (52%) with 30% more from surrounding rural areas. They reported being roughly as involved in their communities as visitors to the ELCs.

Attendees to the EEAW conference were primarily educators; 72% were female, 72% liberal, with 42% having a college degree and an additional 52% having a graduate degree. Seventy percent were neither parents nor grandparents in this group. This group also reported much higher levels of community involvement than the other two groups.

To easily compare the education of the three groups, college and graduate percentages can be added together. Compared in this way, 94% of EEAW participants have college or graduate degrees, compared to 46% for the ELC visitors, and 30% for the Centralia Post Office visitors.

Environmental Learning Center Visitor Responses to the Questions

Percentages given in these tables are rounded to the nearest whole percentage, so they may not always total 100%.

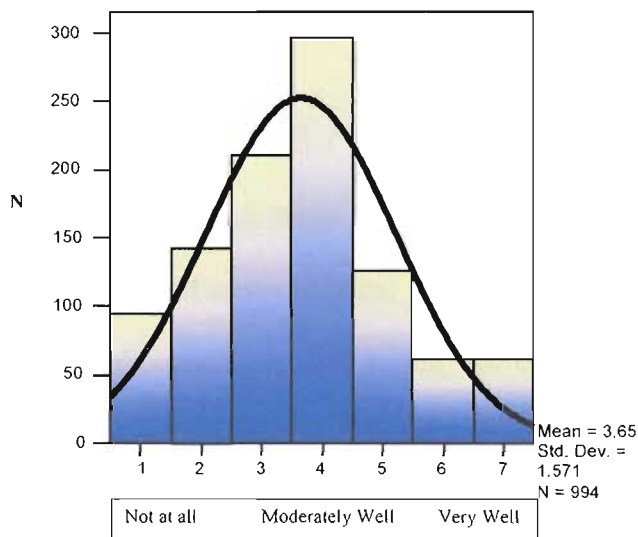


Percent Responding

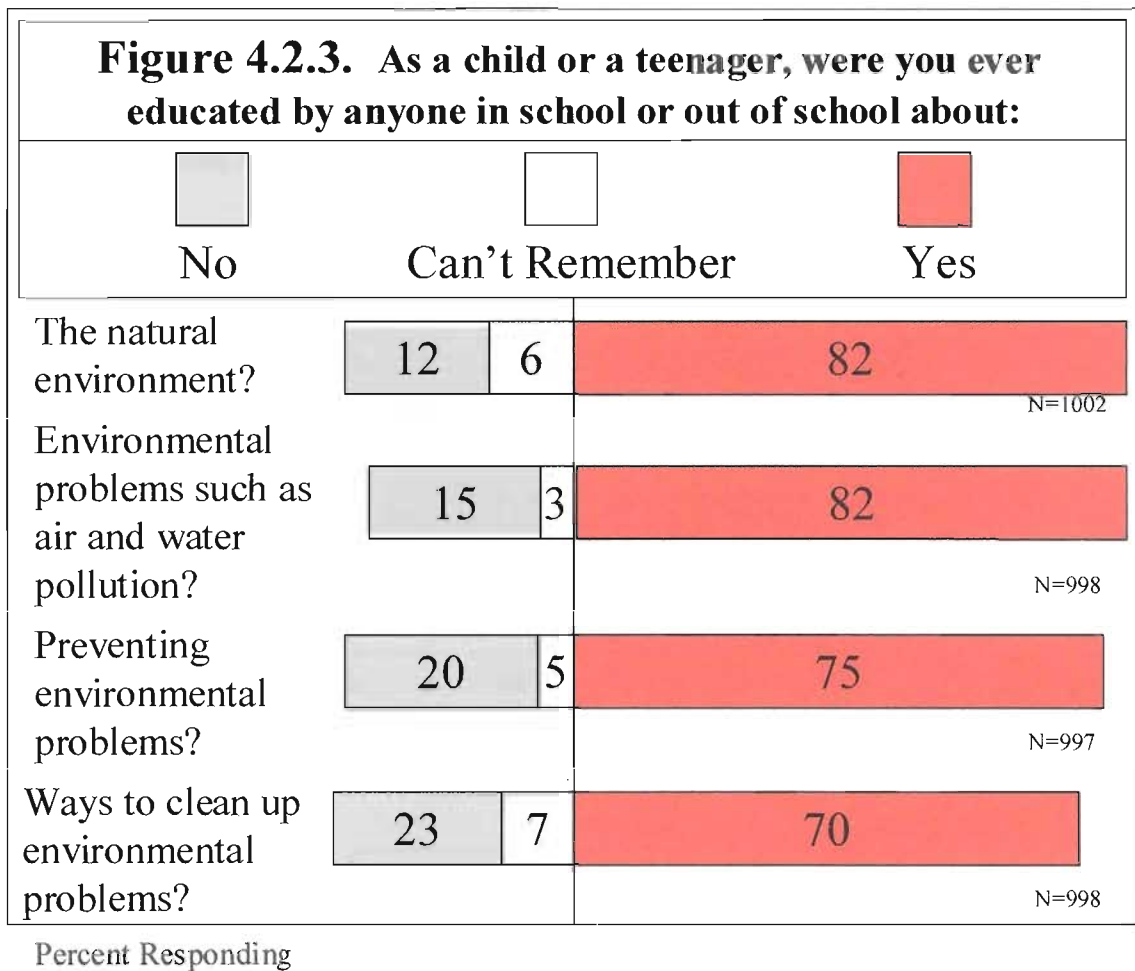
N= 947

As shown in Figure 4.2.1, one quarter of the visitors to the ELCs indicated that they were not familiar with EE.

Figure 4.2.2. Histogram of “How well could you explain what EE is to a friend?”



As Figure 4.2.2 shows, the average respondent thought they could explain EE moderately well. Approximately 55 % felt that they could explain it to a friend at least moderately well.



As shown in Figure 4.2.3, more people reported learning as a child or teen about the natural environment and environmental problems than about preventing or cleaning up problems. Even though these data reveal decreasing percentages as the question focuses in on environmental problems, still, 70 % or more reported having been exposed to all types of EE.

Figure 4.2.4-A

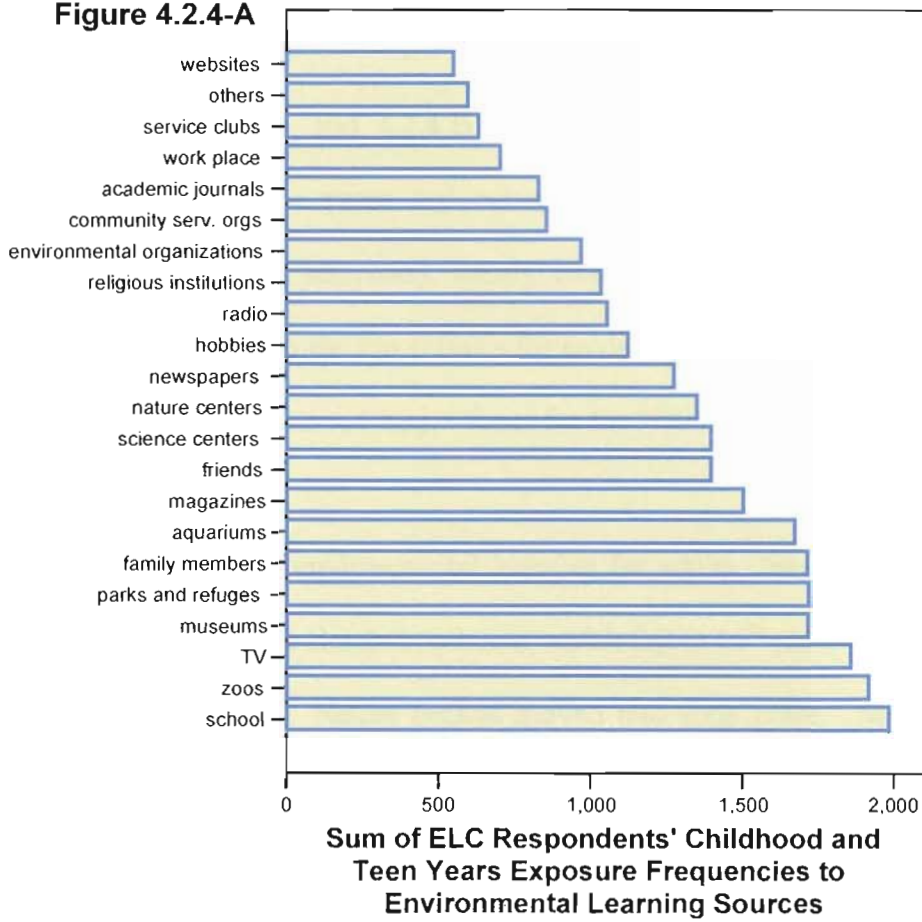
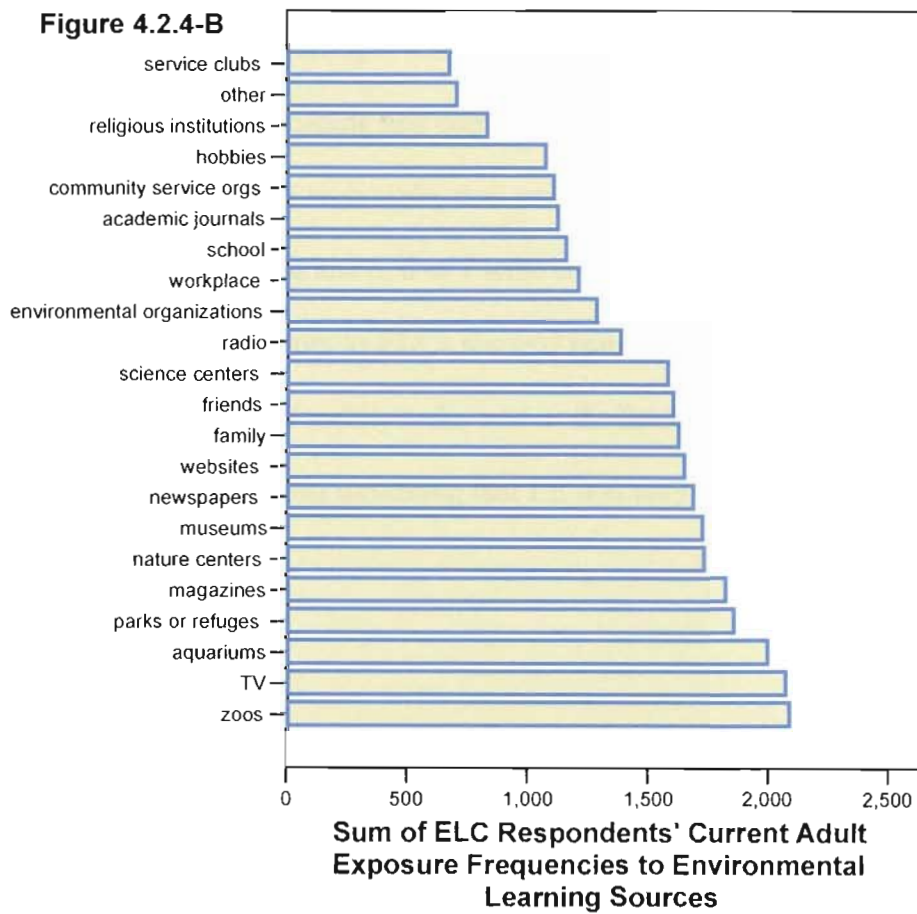


Figure 4.2.4-B



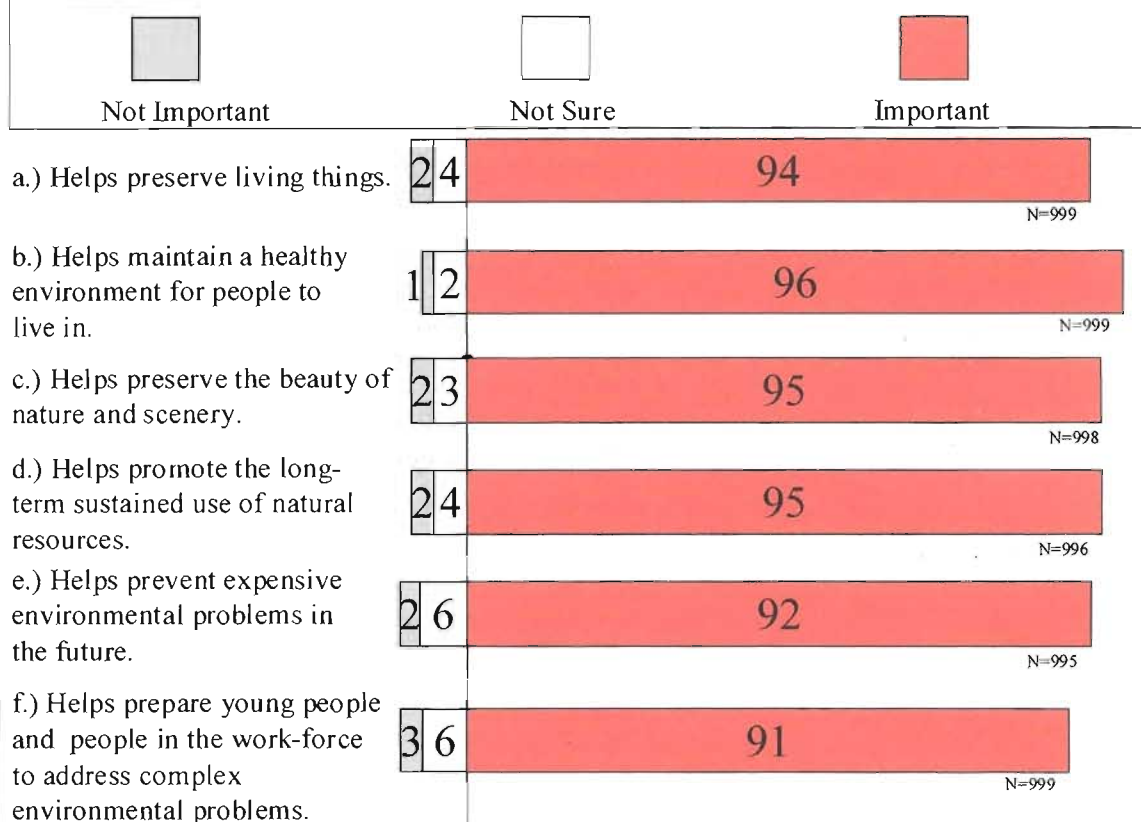
As figures 4.2.4-A and 4.2.4-B indicate, sources for environmental learning during childhood and teen years and current sources as an adult were remarkably different. Schools, zoos, television, family members, museums, parks and refuges, family and aquariums were the top sources for environmental learning during childhood and teen years. Nature centers, a major focus for the National Audubon Society, were in eleventh position.

Current sources of environmental learning for adults changed dramatically with zoos taking the number one slot from schools, which fell to 16th place. Television moved up one into second place. Nature centers moved into sixth place. Magazines moved from eighth place during child and teen years to fifth place for adults. Family members moved from sixth position in childhood and teen years to 10th place for adults. Websites have become an important means for finding information; they were in ninth place.

In Figures 4.2.5 through 4.2.9, data from the ELC respondents have been collapsed to facilitate the reading and comprehension of the numerous questions from the survey. This means that in each table, data responses with a 1, 2, or 3 were combined to indicate a negative response and 5, 6 or 7 were combined to indicate a positive response.

In Question 5, visitors to ELCs showed **consistently high** support for the role of EE in meeting the needs of society today and in the future. Each statement in Question 5 had 55% or more respondents indicating that EE was *very important*.

Figure 4.2.5 How important is the role of EE in meeting the needs of society today and in the future?



Percent Responding.

As Figure 4.2.6 indicates, environmental education consistently received a high amount of support for all of the claims presented in Question 6. “EE shows learners that they should play a positive role in the care of the environment” received the greatest amount of support with a 91% agreement rating. Two negatively worded claims, “EE teaches students that humans are destructive to the earth,” and “EE preaches environmental activism,” both were supported by 50% and 40% of ELC respondents respectively. These are the only two negative claims that were not opposed by the majority. Responses to five of the claims in Question 6 elicited a relatively high percentage of uncertainty. “EE teaches students that humans are destructive to the earth,” “EE makes learners unduly worried about environmental problems,” “EE is essential for preparing learners for jobs later in life,” and “EE challenges the learners to understand

difficult perspectives on complex issues,” received mixed results; the highest percent of uncertainty (37% indicating not sure), “EE preaches environmental activism.”

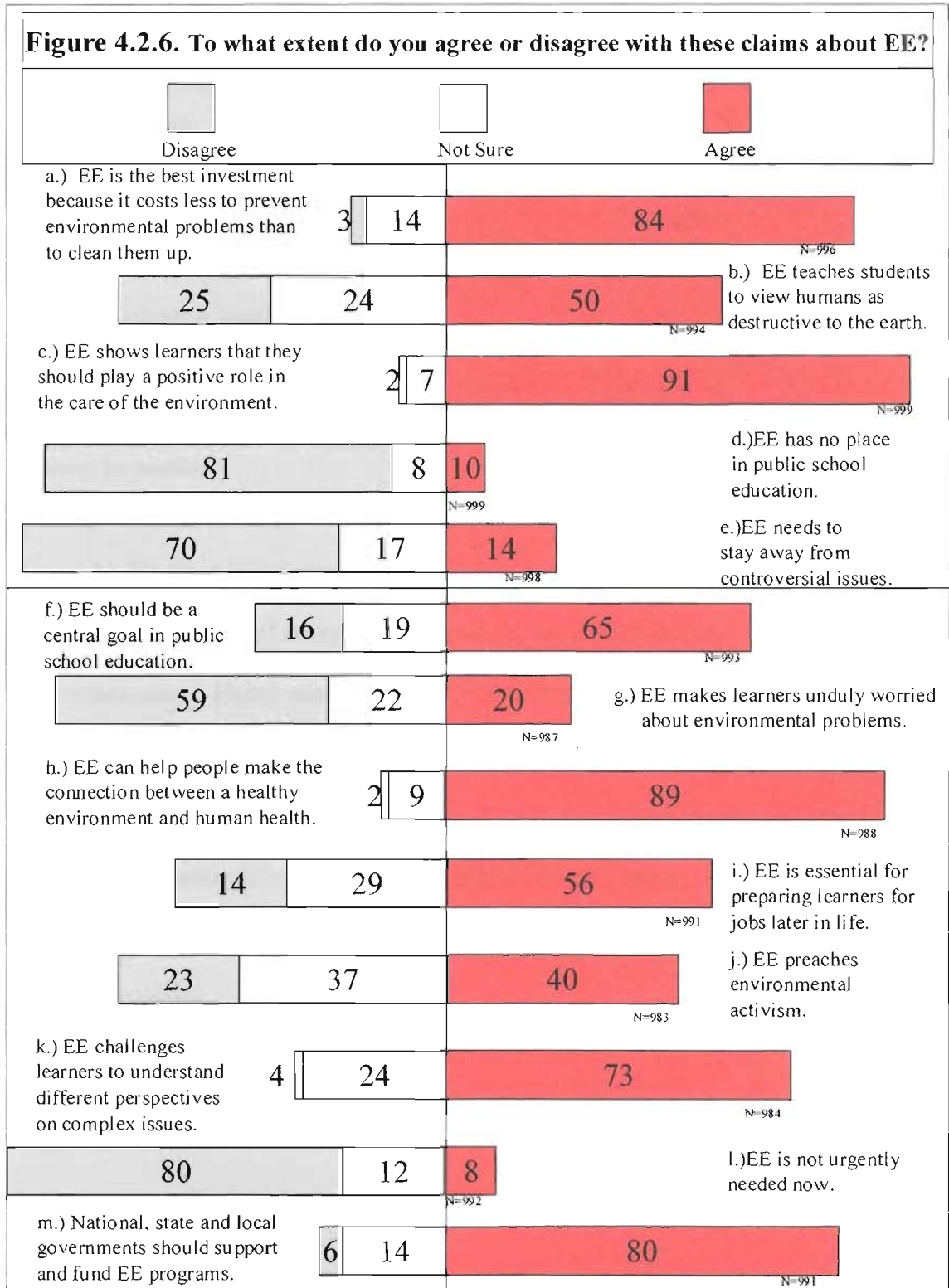
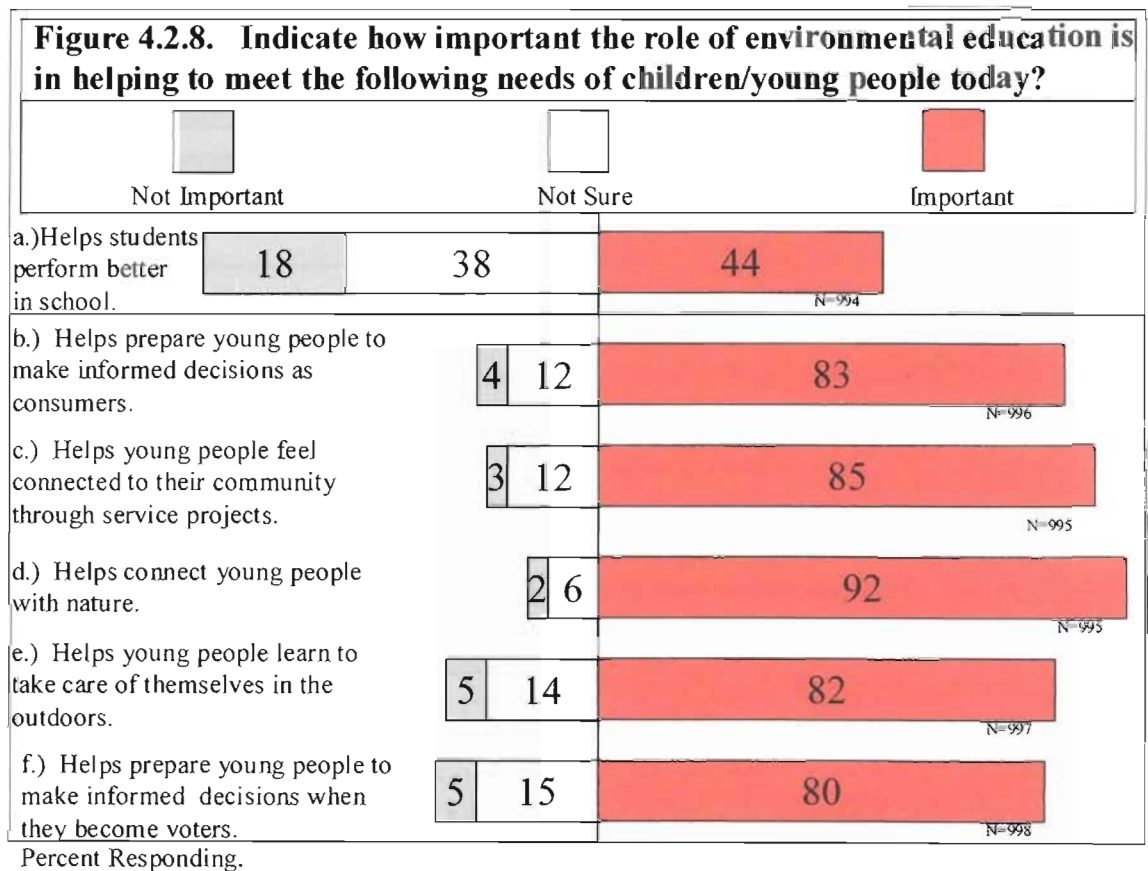


Figure 4.2.7. How concerned are you about the state of our environment today...



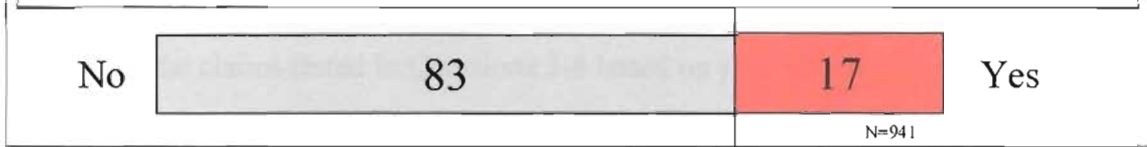
Percent Responding.

As Figure 4.2.7 displays, large percentages of ELC respondents indicated they have a very high level of concern for the world, the United States, Washington State and local community. Eighty-nine percent of respondents expressed concern about the state of the environment for the United States. In addition, their responses matched the expected trend predicted by Kevin Coyle of the National Environmental Education and Training Foundation (Coyle, personal communication, 2004). A higher percentage of respondents expressed uncertainty regarding their level of concern for their state and local communities.



As Figure 4.2.8 indicates, respondents were very supportive of the claims in Question 8 regarding how important EE is in meeting the needs of children/young people today. However, in rating how important EE is in helping students perform better in school, 38% of respondents indicated that they were uncertain about this claim. This means that at least 38% of respondents are not aware of the positive results teachers have had using EE in the classroom.

Figure 4.2.9. Are you aware of the Washington State law requiring EE as a part of all basic subject matter K-12?



Percent Responding

In a survey done by the Northwest Environmental Education Council in association with the Washington State Office of Environmental Education in 2001-2002, 77% of the teachers who responded to the survey were aware of the Washington State mandate for environmental education (Angell 2002). However, only 17% of respondents from ELCs indicated they were aware of the mandate.

Summary of Environmental Learning Center Visitor Responses to Questions

Visitors to ELCs showed very strong support for EE with 27 out of 29 claims tested. Eighty percent agreed that EE is urgently needed now. Ninety-one percent agreed that EE shows learners that they should play a positive role in the environment. Eighty percent thought that national, state and local government should support and fund EE, and 92% thought EE connects children with nature. A much lower percentage (44%) supported the claim, “EE helps students perform better in school,” with 38% expressing uncertainty for this claim.

**Comparisons of Environmental Learning Centers with the Centralia Post Office
and the Environmental Education Association of Washington Conference**

No strong or even moderate differences were found between the three respondent groups for the claims tested in Questions 3-8 based on $p < .05$. The p-value measures the amount of statistical evidence that supports the alternative hypothesis. A value of .05 was chosen because it is generally considered a standard value. At a level of .05, there is a 5% chance that the null hypothesis will be rejected when the null is true. Most differences found in the comparisons between the groups were weak or weak to non-existent based on Cramer's V, a post-test of Pearson's chi square, or the results from Spearman's rho for the correlation questions. This means that while differences were significant, they were small. (Please note that the scales on the y-axes differ on each graph.) Please see Table 4.3.1 for demographic information from the three study groups.

Table 4.3.1 Demographic Information

		Environmental Learning Centers	Centralia Post Office	EAW Conference
Gender	Female	60% (594)	59% (57)	72% (46)
	Male	40% (394)	41% (40)	28% (18)
Age	18-24 years	13% (132)	7% (7)	13% (8)
	25-34 years	35% (348)	22% (22)	34% (22)
	35-44 years	29% (288)	16% (15)	22% (14)
	45-54 years	14% (135)	21% (21)	22% (14)
	55-64 years	7% (66)	21% (21)	8% (5)
	65 or older	3% (29)	13% (13)	2% (1)

		Environmental Learning Centers	Centralia Post Office	EAW Conference
Occupation				
	stay-at-home	8% (72)	11% (9)	0%
	student	7% (69)	8% (7)	7% (4)
	teacher	7% (62)	4% (3)	61% (38)
	health care worker	10% (93)	5% (4)	0%
	other white collar	34% (341)	21% (18)	23% (14)
	natural resource extractor	1% (8)	4% (3)	0%
	blue collar	15% (144)	19% (16)	0%
	military	4% (34)	1% (1)	0%
	retired	4% (33)	16% (13)	3% (2)
	other	8% (78)	12% (10)	7% (4)
Education				
	high school	16% (160)	19% (19)	0%
	some college	37% (368)	51% (50)	7% (4)
	4-year college degree	26% (260)	21% (21)	42% (26)
	graduate school	20% (200)	9% (9)	52% (32)
Children				
	parent	58% (576)	32% (31)	19% (12)
	grand-parent	11% (110)	36% (35)	11% (7)
	neither	31% (310)	32% (31)	70% (44)

		Environmental Learning Centers	Centralia Post Office	EEAW Conference
Political Views	conservative	22% (202)	32% (28)	5% (3)
	moderate	31% (290)	31% (27)	7% (4)
	liberal	27% (247)	13% (11)	72% (44)
	independent	20% (189)	24% (21)	16% (10)
Area of Residence	urban	30% (288)	10% (10)	36% (22)
	suburban	38% (366)	7% (7)	21% (13)
	small town	19% (183)	52% (52)	27% (17)
	rural	14% (135)	30% (29)	16% (10)

Question 1: Are you aware of a field of study known as environmental education?

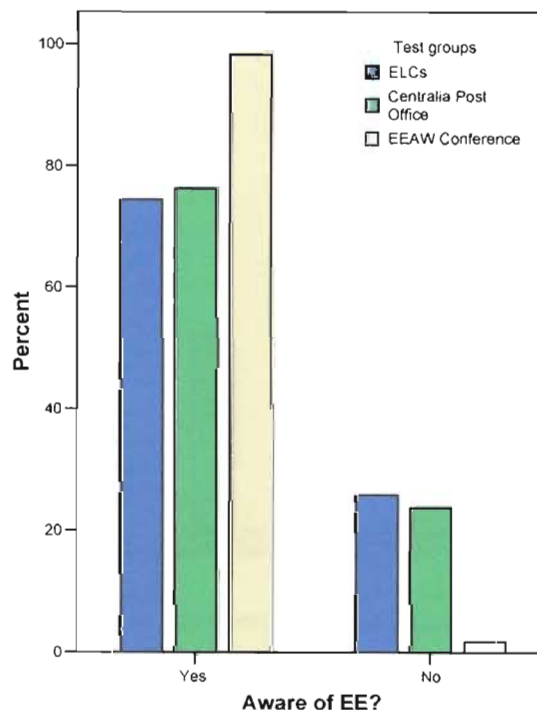
There was a significant difference between the groups. Based on Cramer's V, the relationship is weak.

Figure 4.3.1.

There was a significant difference between the three groups.

$\chi^2(2)=16.743$:
 $p=.000$
 Cramer's V
 $=.123$

N=1101



As indicated in Figure 4.3.1, respondents from the Environmental Education Association of Washington Conference were more aware of EE than respondents from the other two groups.

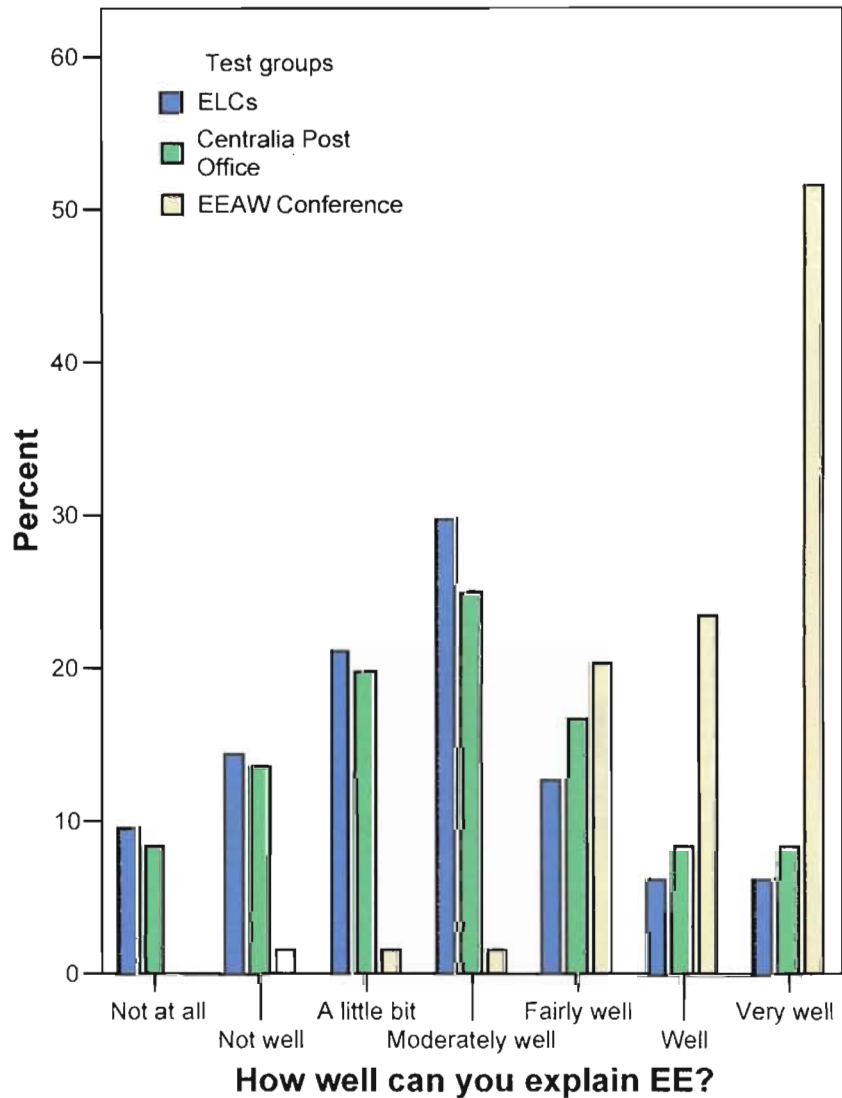
Question 2

As shown in Figure 4.3.2, there were significant differences between the responses in the three groups as to how well they could explain what EE is to a friend. Environmental education professionals at the EEAW conference scored significantly higher on this question than the other two groups.

Figure 4.3.2.

There were significant differences between the three groups.

$\chi^2(12)=208.668$:
 $p=.000$
 Cramer's V = .301
 N=1154



Question 3

As revealed in Figure 4.3.3.A, B, C, and D, differences between the three groups for the four parts of Question 3 were either extremely weak as in A and B, or non-existent as in C or D. This means that there was little difference between the groups regarding EE received as a child or a teen.

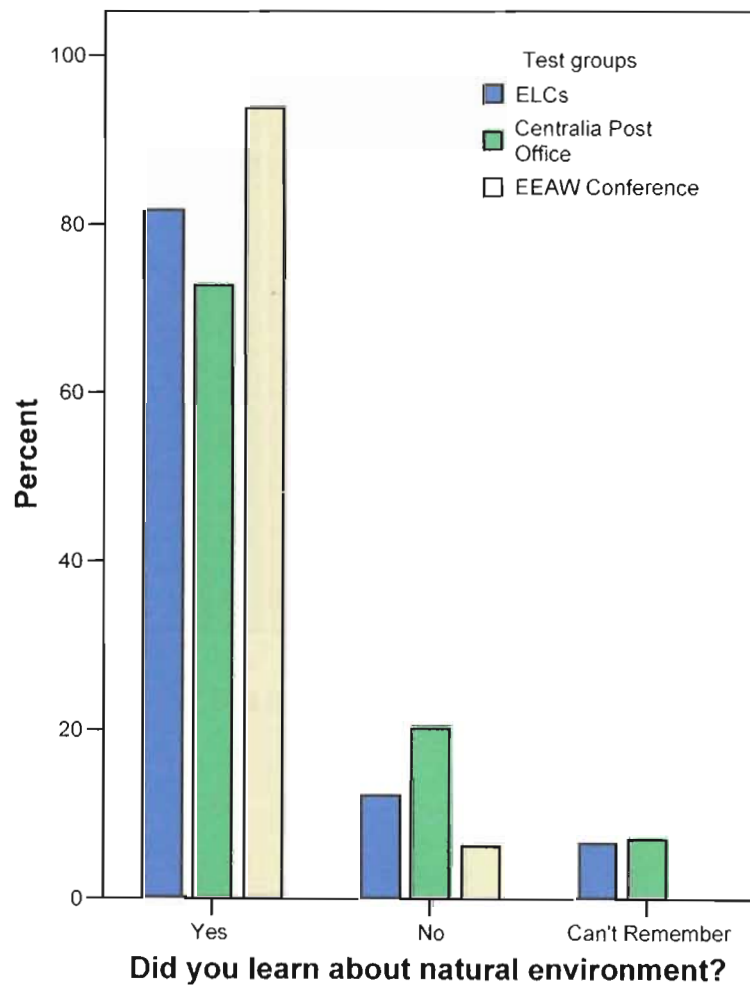
Question 3(A): As a child or teenager were you ever educated by anyone in school or out of school about:

Figure 4.3.3.A.

There were significant but weak to nonexistent differences between the groups.

$\chi^2(4)=13.180$:
 $p=.010$
Cramer's V=
.075.

N=1165



Question 3(B): As a child or teenager were you ever educated by anyone in school or out of school about:

Figure 4.3.3.B.

There were significant but weak to nonexistent differences between the groups.

$\chi^2(4)=10.722$:
 $p=.030$
 Cramer's
 $V=.068$

N=1160

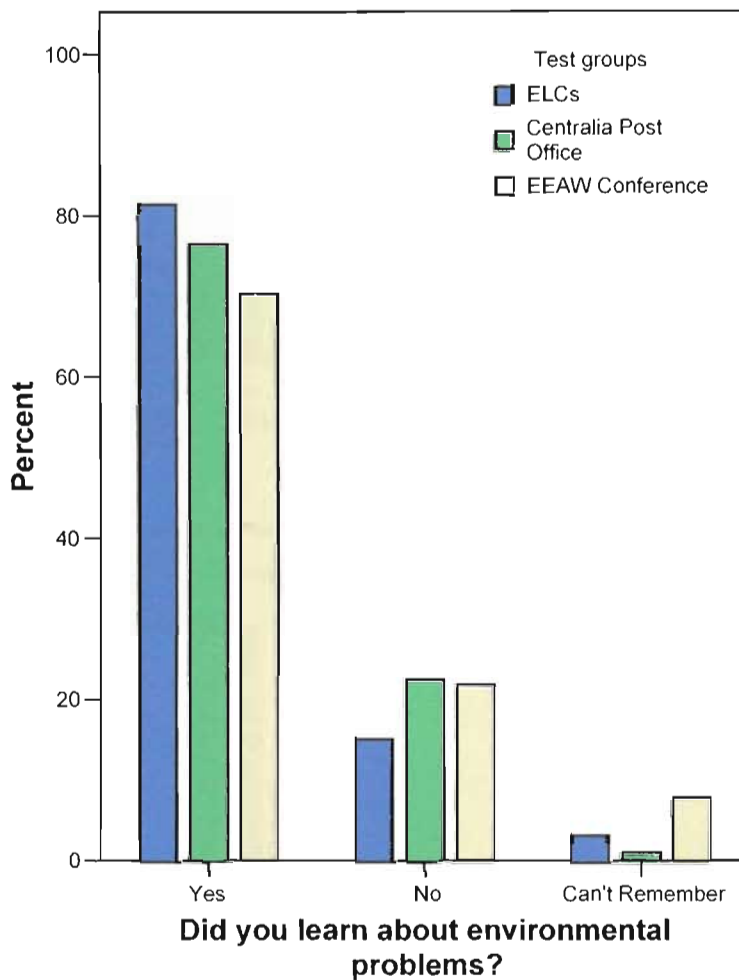


Figure 4.3.3.C.

Question 3(C): As a child or teenager were you ever educated by anyone in school or out of school about:

There were no significant differences between the three groups.

$\chi^2(4)=6.207$:
 $p=.184$
 Cramer's
 $V=.152$

$N=1159$

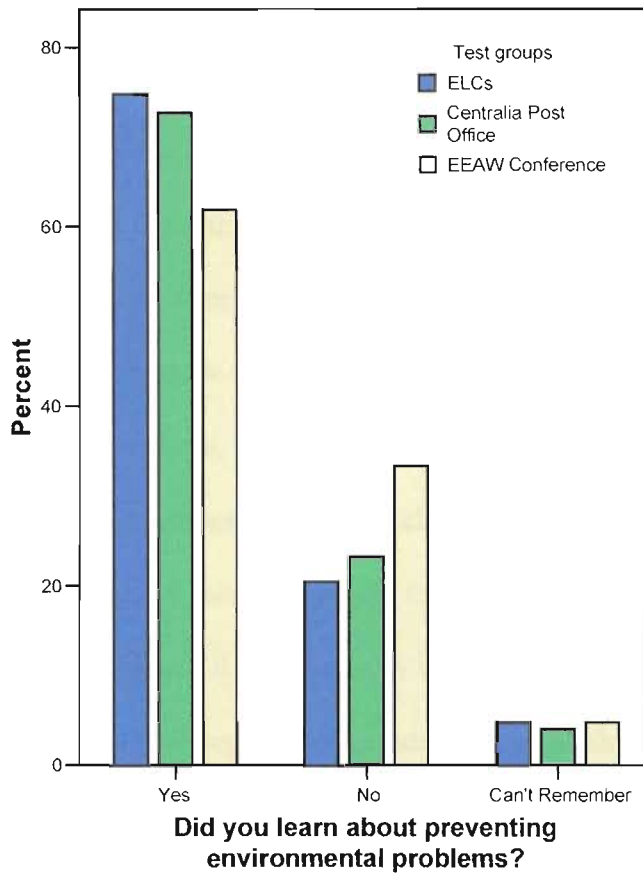


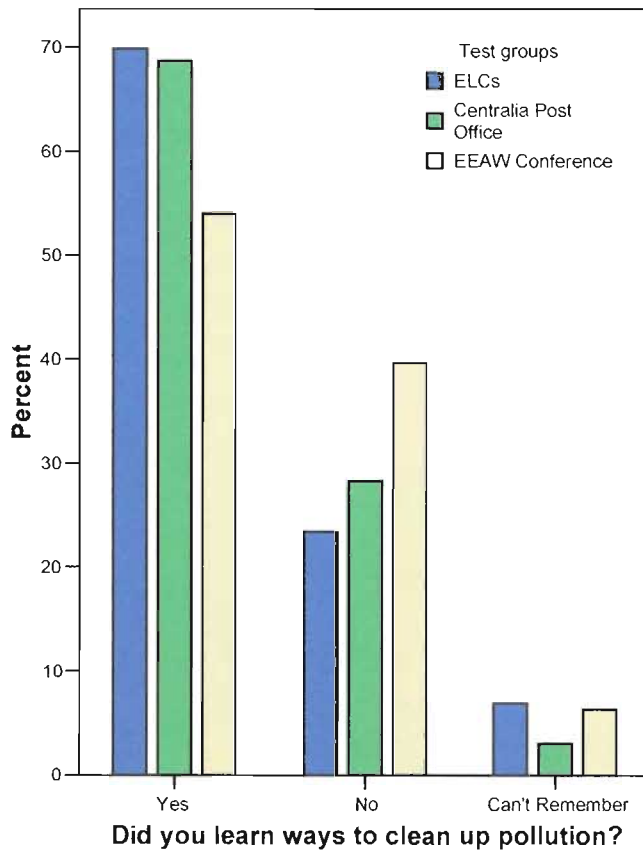
Figure 4.3.3.D.

Question 3(D): As a child or teenager were you ever educated by anyone in school or out of school about:

There were no significant differences between the three groups.

$\chi^2(6)=11.531$:
 $p=.073$
 Cramer's $V=.071$

$N=1160$



Question 4 and 5

Because of time constraints and the complexity of the question, comparisons of the responses between the three groups were not made for Question 4. All 1002 responses from ELC visitors were used to create the charts seen in Section 4.2.

In Question 5, for the statistical analysis, the data had to be collapsed. This means that the three responses that voiced disagreement with each claim were grouped as one response because individually the numbers were too small to be evaluated using chi-square. The overall responses for the claims for Question 5 were very high indicating strong and widespread support for the EE messages by respondents from all three groups. The graphs demonstrate small, insignificant differences between the three groups. In each graph the EEAW respondents show slightly higher support for each claim. Significant differences were seen in Question 5(f), “How important is the role of EE in helping prepare young people and people in the workforce to address environmental problems.” However, the only noticeable difference seen in Figure 4.3.5(f), was simply that the EEAW showed an even higher level of support than was shown in their responses to the first five claims in Question 5.

Figure 4.3.5a.

Question 5: Indicate how important the role of EE is in helping to meet the following needs of society today and in the future:

There were no significant differences between the three groups.

$\chi^2(8)=14.251$:
 $p=.075$
 Cramer's V =
 .078

N=1162

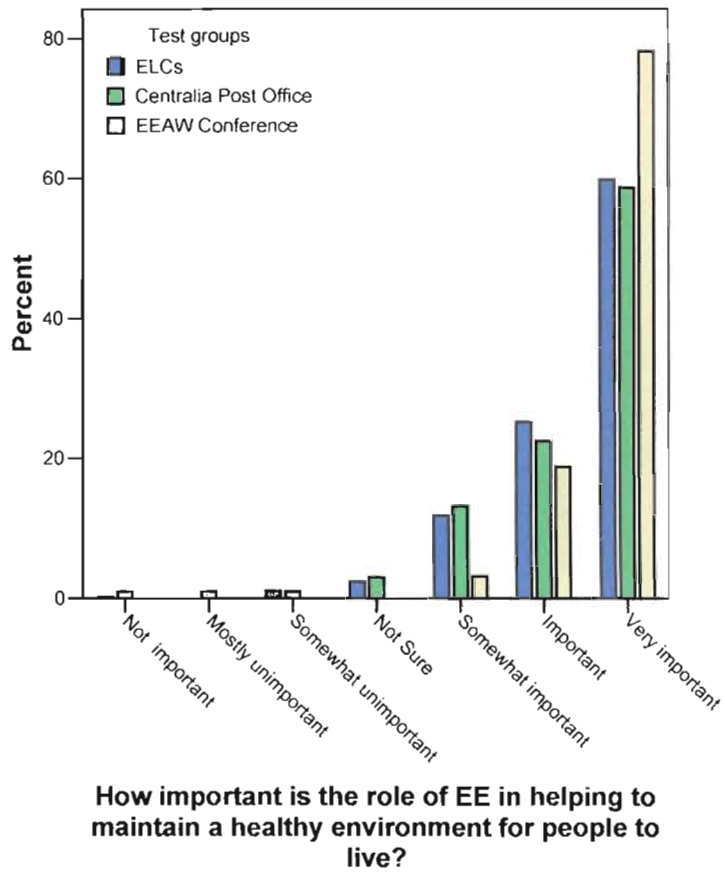


Figure 4.3.5b.

There were no significant differences between the three groups.

$\chi^2(8)=13.156$:
 $p=.107$
 Cramer's V =
 .075

N=1162

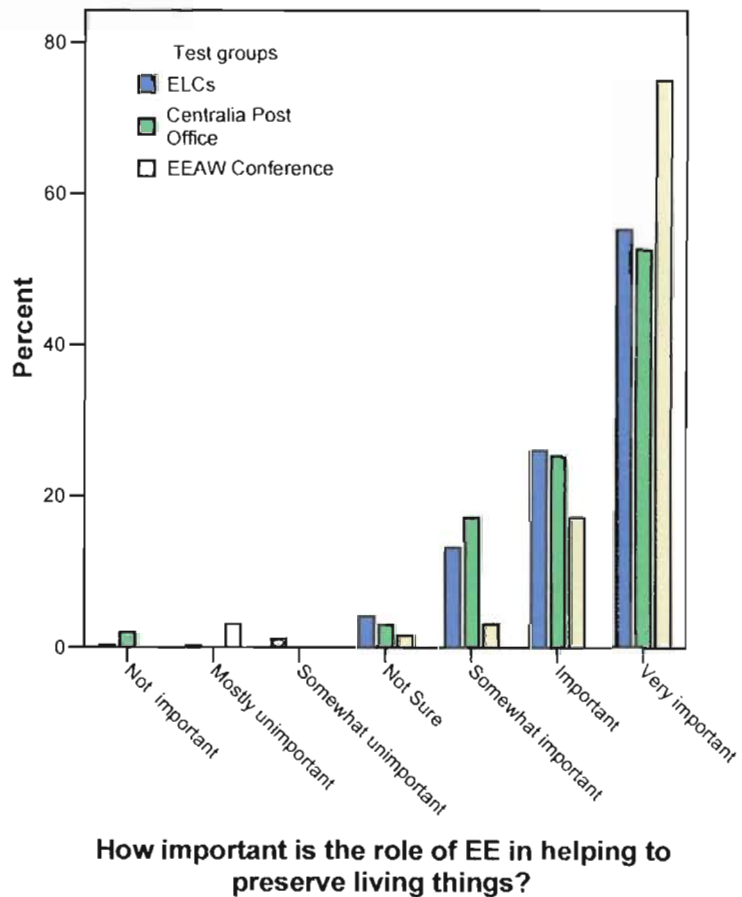
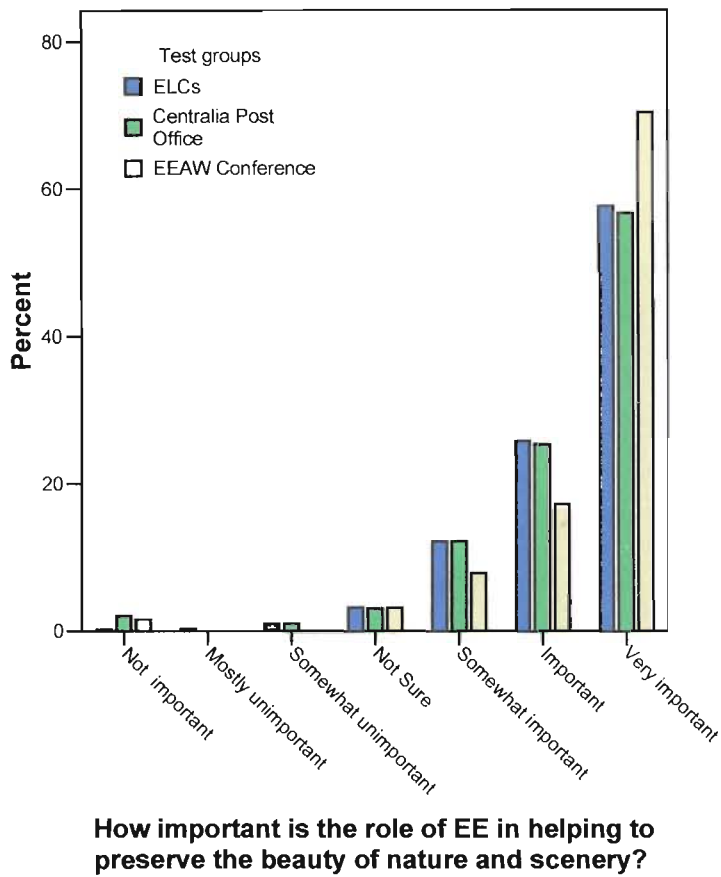


Figure 4.3.5c.

There were no significant differences between the three groups.

$\chi^2(8)=5.695$:
 $p=.681$
 Cramer's V=
 .050

N=1161



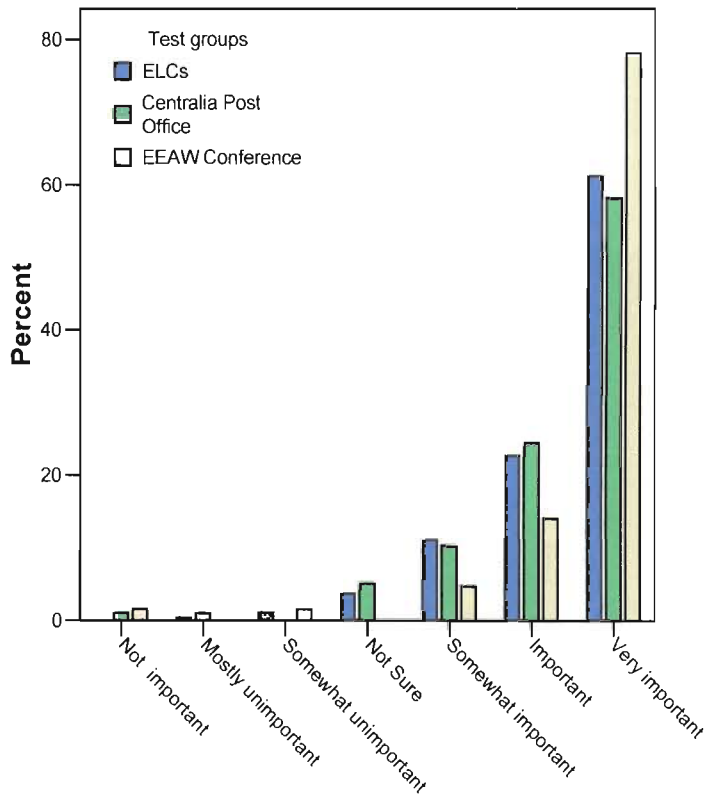
How important is the role of EE in helping to preserve the beauty of nature and scenery?

Figure 4.3.5d.

There were no significant differences between the three groups.

$\chi^2(8)=11.320$:
 $p=.184$
 Cramer's V=
 .070

N=1158



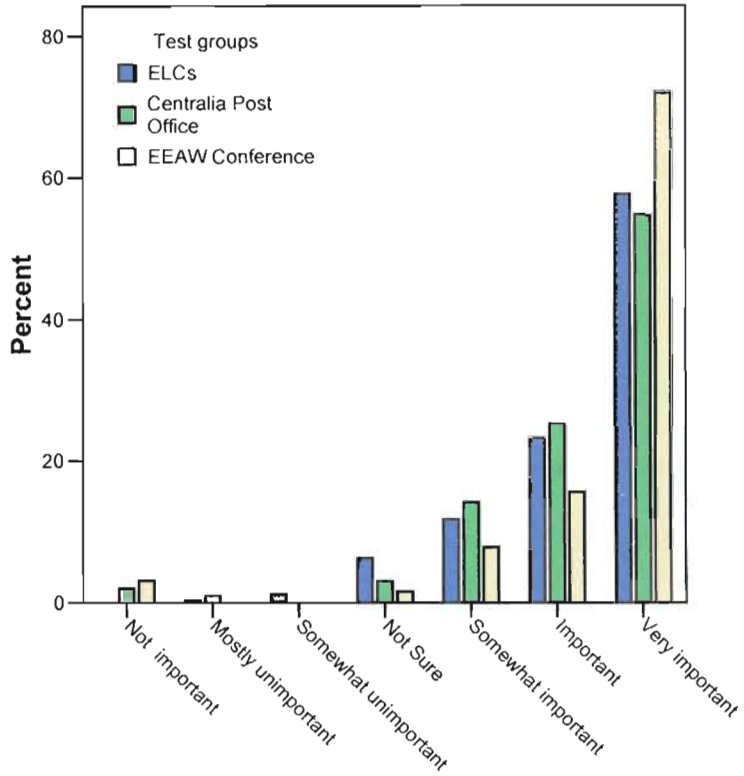
How important the role of EE is in helping to promote long-term sustained use of natural resources?

Figure 4.3.5e.

There were no significant differences between the three groups.

$\chi^2(8)=10.472$:
 $p=.233$
 Cramer's $V=.067$

$N=1158$



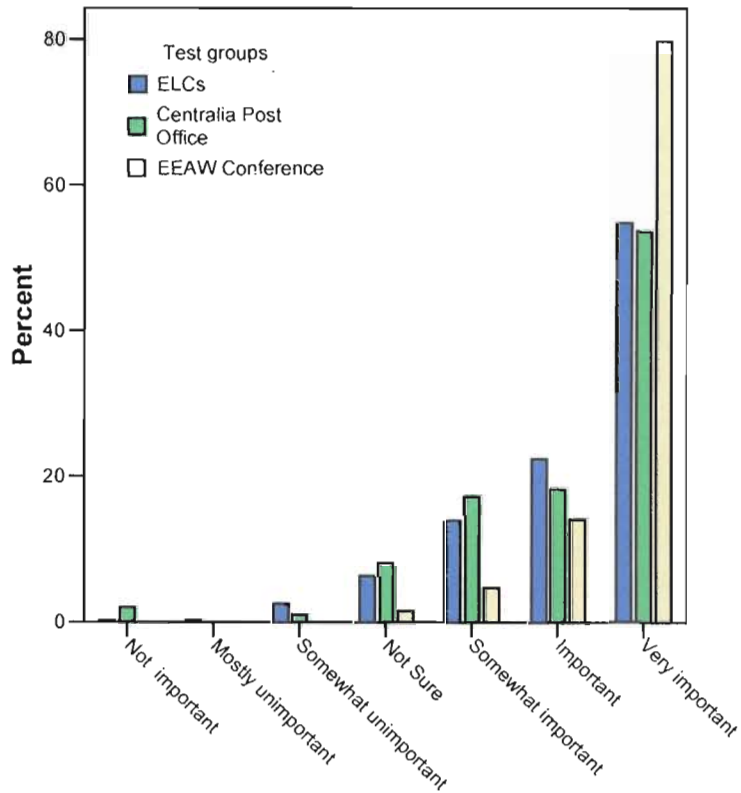
How important is the role of EE in helping to prevent expensive environmental problems?

Figure 4.3.5f.

There were significant but very weak to nonexistent differences between the three groups.

$\chi^2(8)=18.746$:
 $p=.016$
 Cramer's $V=.090$

$N=1162$



How important is the role of EE in helping prepare young people and people in the workforce to address environmental problems?

Question 6

In this section, the graphs exhibit the respondents' results for all points on the survey scale. However, for statistical analysis purposes, some of the questions had to have the data collapsed to make the tests valid for the chi square test; this was done wherever the numbers of disagreement were really low. The value of Cramer's V test indicates the strength of the difference. Values below .200 are considered weak. Values less than .1 are very weak and are considered by some in the statistical business to be nonexistent. The small differences in the groups appear to be that the EEAW group is somewhat more supportive of EE just as they were in Question 5. The ELC group and the CPO group showed more *uncertainty* than the EEAW group rather than a lack of support. This appeared to be the case for every claim tested.

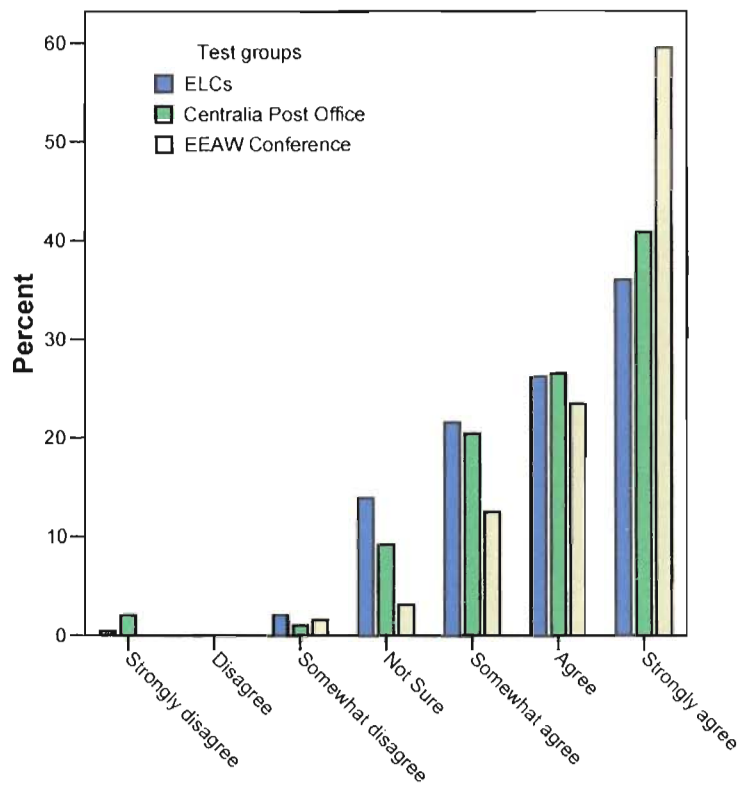
Figure 4.3.6a.

Question 6: Please tell us the extent to which you agree or disagree with these claims about EE.

There were significant but weak differences between the three groups.

$\chi^2(8)=18.423$:
 $p=.018$
 Cramer's V=
 .089

N=1158



EE is the best investment because it costs less to prevent environmental problems than to clean them up.

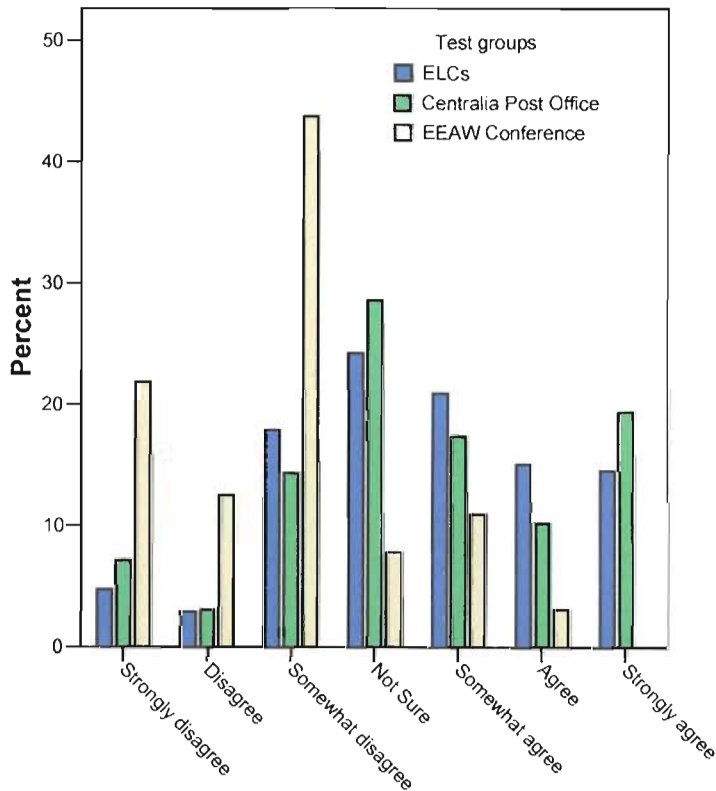
Figure 4.3.6b.

There were significant but weak differences between the three groups

$\chi^2(12)=98.388$:
 $p=.000$
 Cramer's V=
 .206

N=1156

There seemed to be much uncertainty overall about this claim.



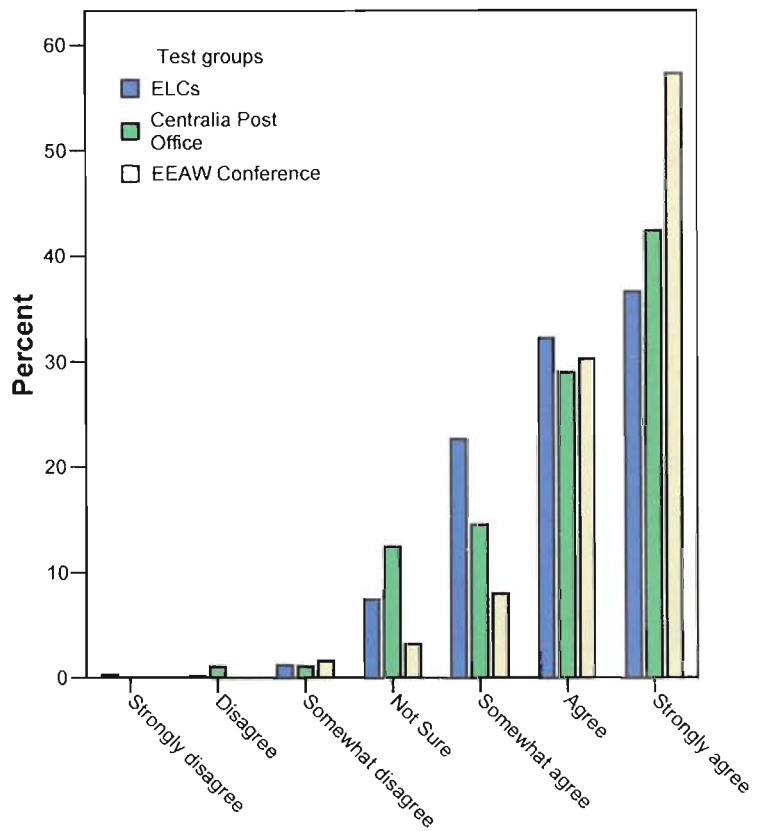
EE teaches learners to view humans as destructive to the earth.

Figure 4.3.6c.

There were significant but weak differences between the three groups.

$\chi^2(8)=20.353$;
 $p=.009$
 Cramer's V=
 .094

N=1159



EE shows learners that they should play a positive role in the environment.

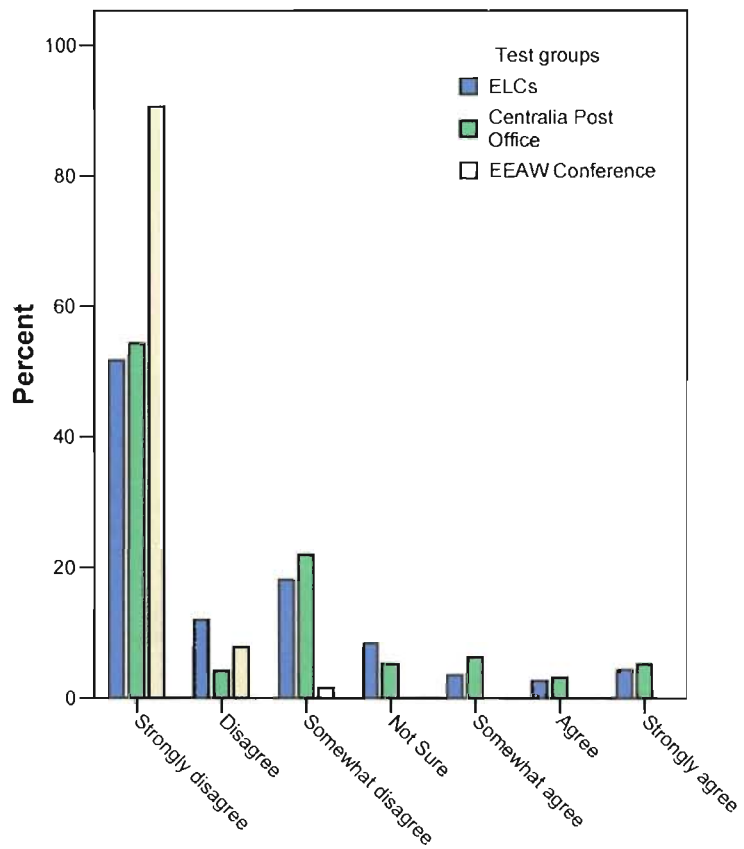
Figure 4.3.6d.

There were significant but weak differences between the three groups.

$\chi^2(8)=47.477$;
 $p=.000$
 Cramer's V=
 .143

N=1159

EEAW respondents were very clear in their disagreement with this claim with over 90% dissenting.



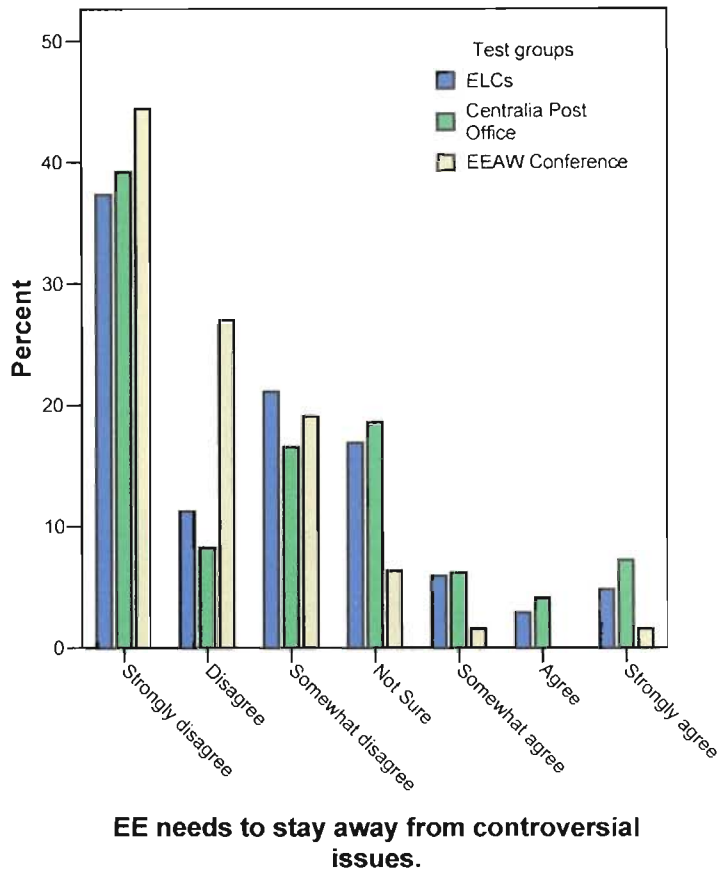
EE has no place in public school.

Figure 4.3.6e.

There were significant but weak differences between the three groups.

$\chi^2(12)=26.540$:
 $p=.009$
 Cramer's V=
 .107

N=1158



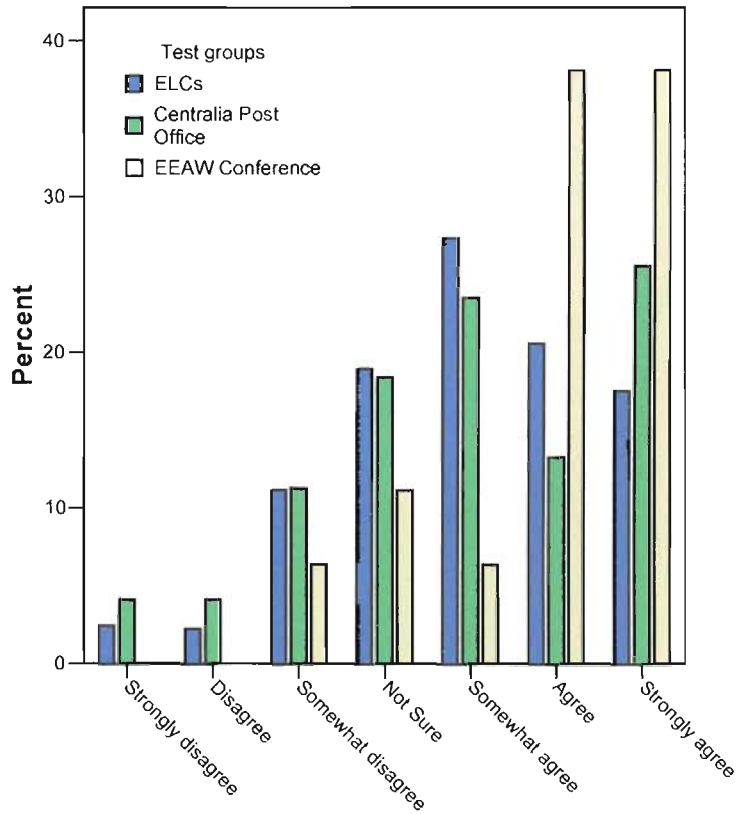
EE needs to stay away from controversial issues.

Figure 4.3.6f.

There were significant but weak differences between the three groups.

$\chi^2(12)=45.819$:
 $p=.000$
 Cramer's V=
 .141

N=1154



EE should be a central goal in public school education.

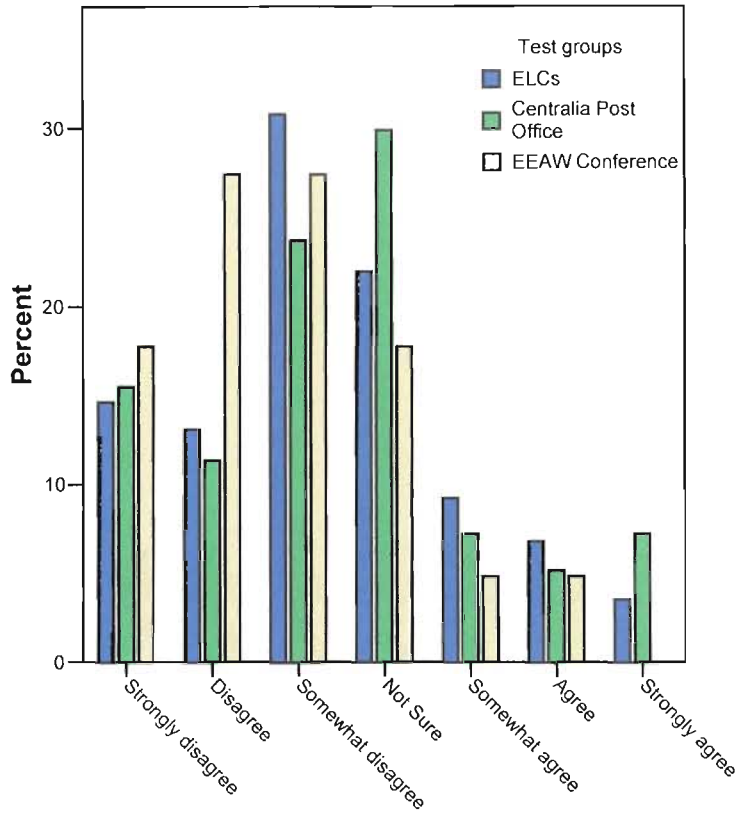
A great deal more uncertainty was seen by the ELC and CPO respondents than by the EEAW respondents.

Figure 4.3.6g.

There were significant but weak differences between the three groups.

$\chi^2(12)=22.227$:
 $p=.035$
 Cramer's V=
 .098

N=1146



There seemed to be some confusion among all three groups regarding this claim.

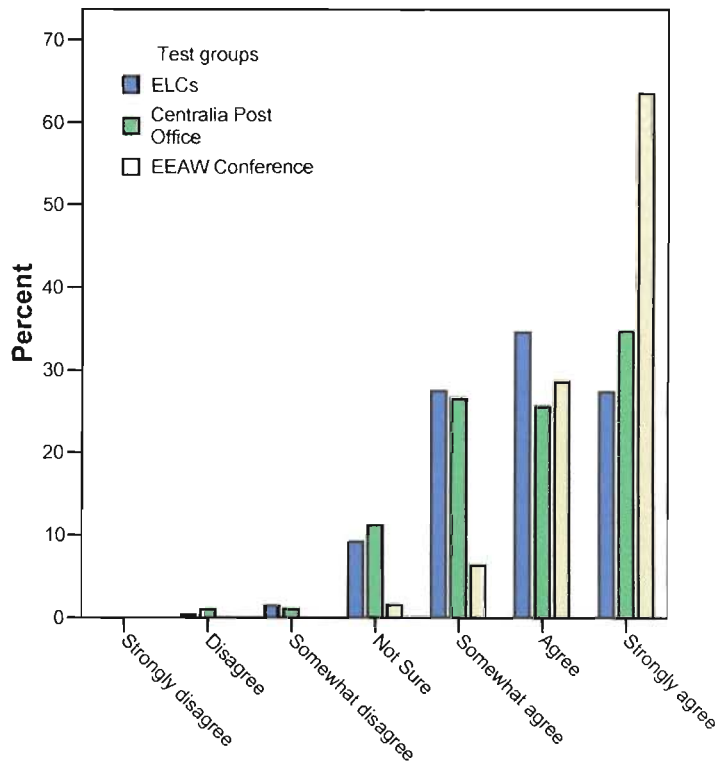
EE makes learners unduly worried about environmental problems.

Figure 4.3.6h.

There were significant but weak differences between the three groups.

$\chi^2(8)=45.161$:
 $p=.000$
 Cramer's V=
 .140

N=1149



EE can help people make the connection between a healthy environment and human health.

Figure 4.3.6i.

There were significant but weak differences between the three groups.

$\chi^2(12)=38.085$:
 $p=.000$
 Cramer's V=
 .129

N=1153

Uncertainty was again evident among ELC and CPO groups.

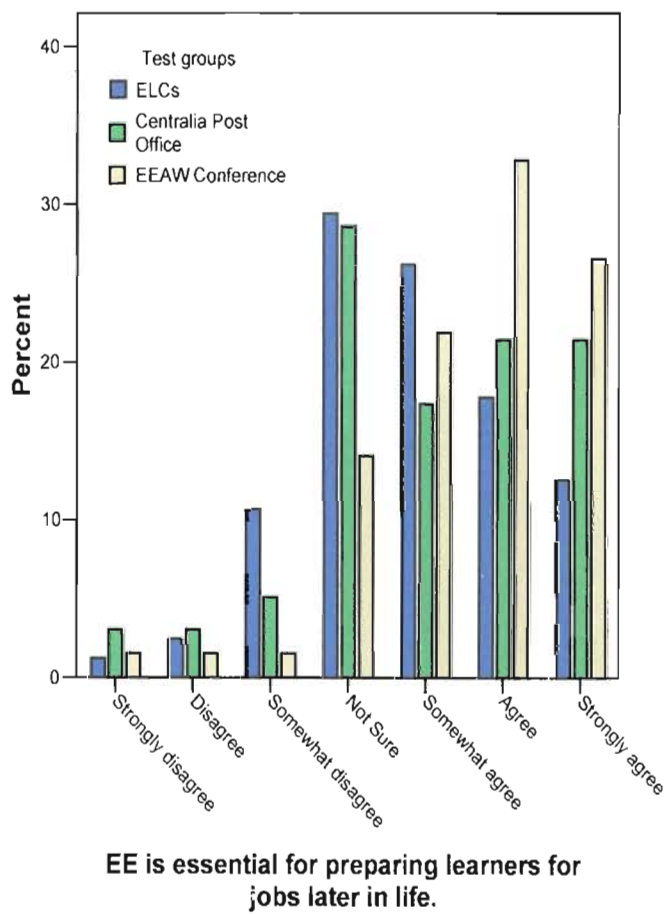


Figure 4.3.6j.

There were no significant differences between the three groups.

$\chi^2(12)=70.892$:
 $p=.000$
 Cramer's V=
 .176

N=1143

This question caused a lot of uncertainty. It may have been a better question if it had been stated either that "EE teaches environmental activism," but we had attempted to frame it as a negative claim.

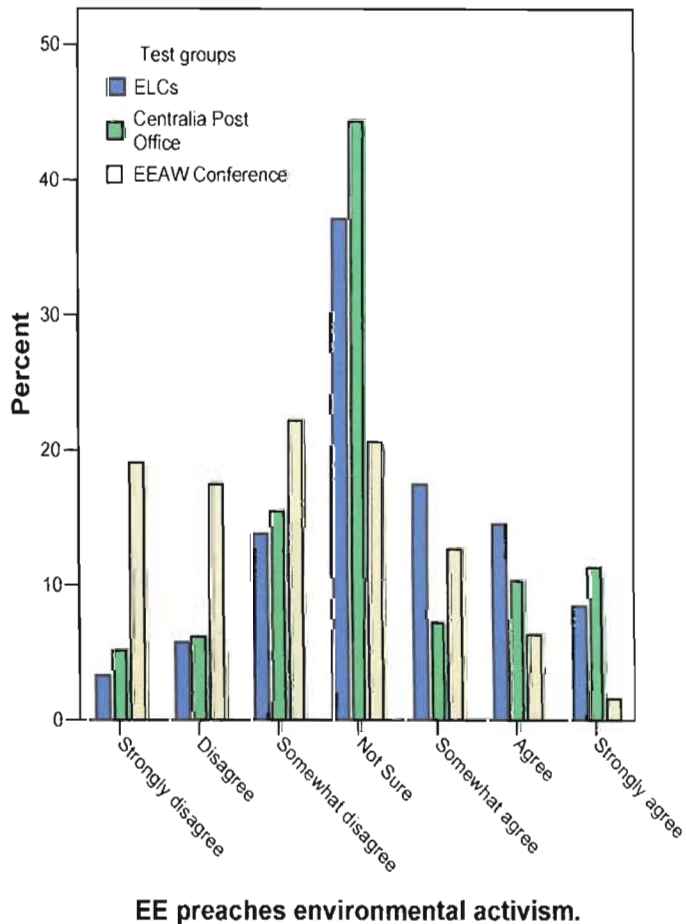
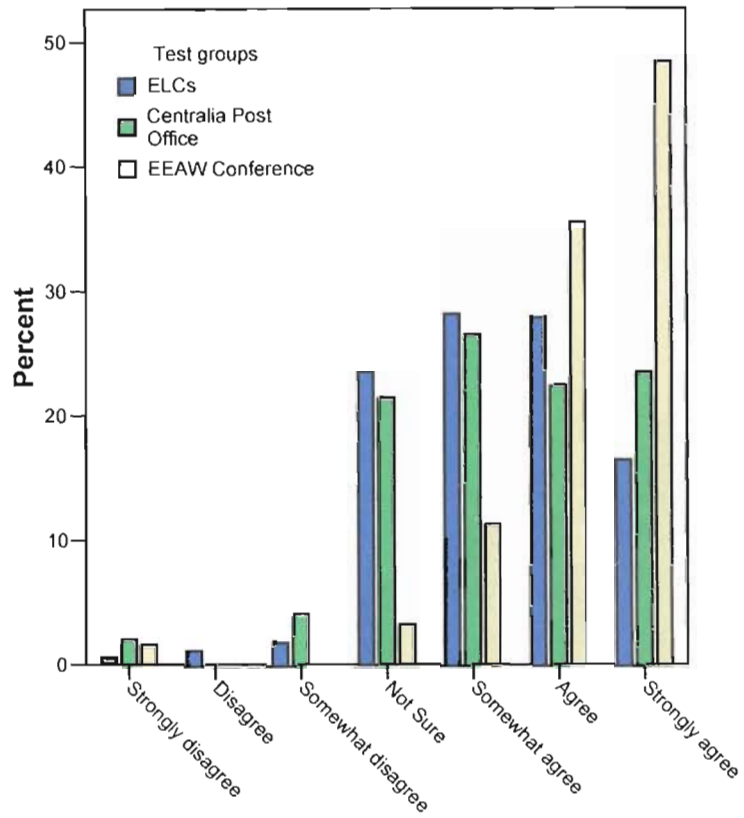


Figure 4.3.6k.

There were significant but weak differences between the three groups.
 $\chi^2(8)=54.105$:
 $p=.000$
 Cramer's V=
 .154
 N=1144

Again there was uncertainty and less strength in the level of support for this question. EEAW respondents were pretty clear about their thoughts on this claim.

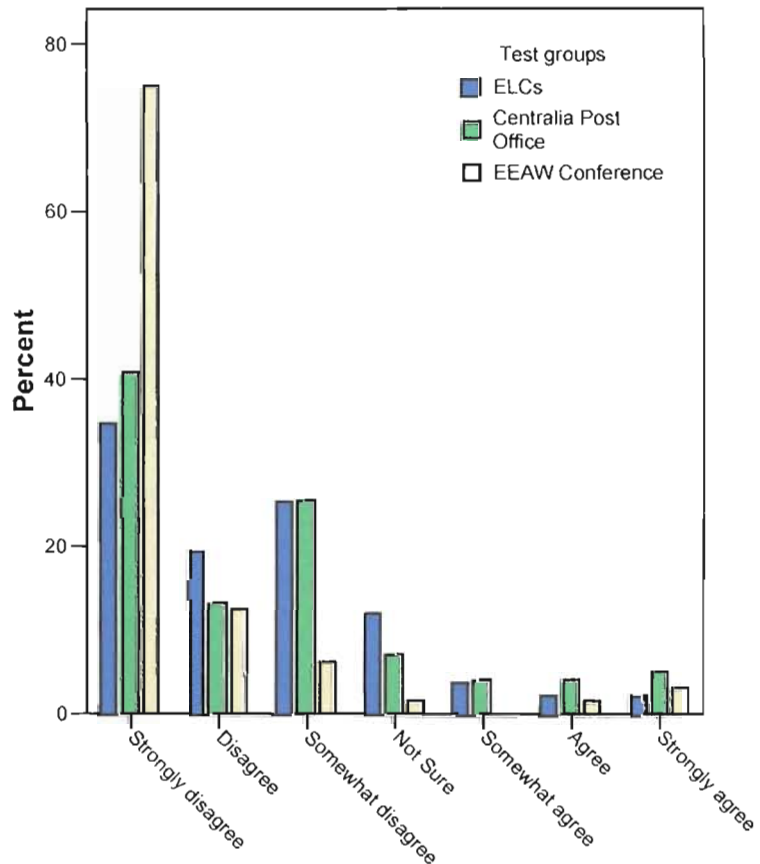


EE challenges learners to understand different perspectives on complex issues.

Figure 4.3.6l.

There were significant but weak differences between the three groups.
 $\chi^2(8)=49.615$:
 $p=.000$
 Cramer's V=
 .147
 N=1154

EEAW respondents strongly disagree with this claim.



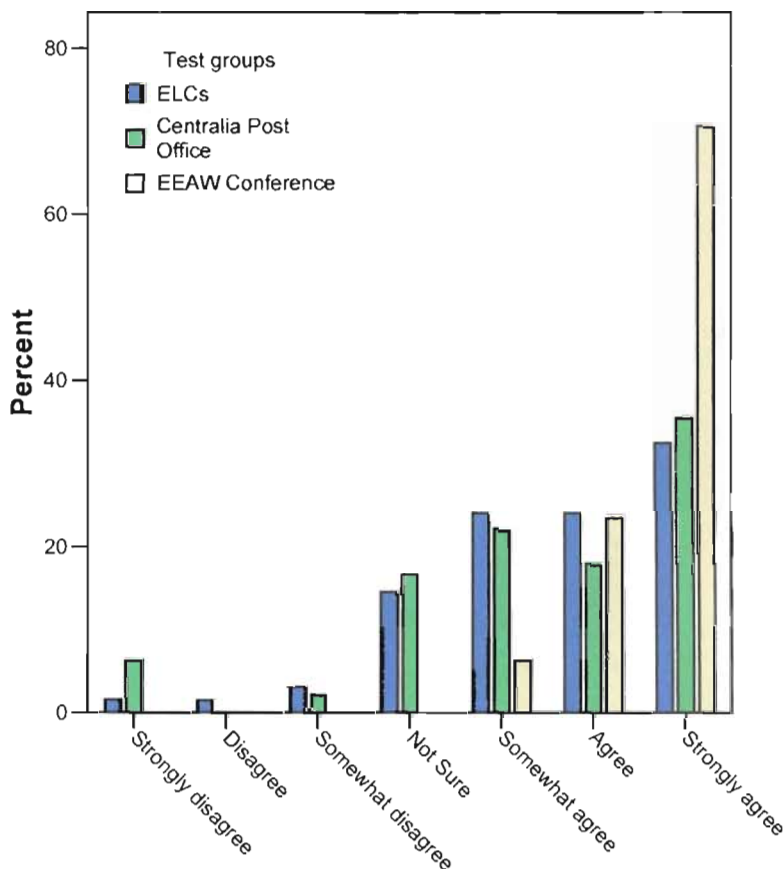
EE is not urgently needed now.

Figure 4.3.6m.

There are significant but weak differences between the three groups.

$\chi^2(8)=49.038$:
 $p=.000$
 Cramer's V=
 .146

N=1151



National, state and local governments should support and fund EE programs.

This claim had nearly unanimous agreement outside of the small degree of uncertainty expressed by the ELC and CPO groups.

Question 7

The levels of concern expressed in Question 7 a, b, c, and d, between the three groups for the state of the environment for the world, the United States, Washington state and the local community are significantly different but those differences are weak. The differences appear again to be that the EEAW respondents showed more concern overall while the ELC group and the CPO group showed more uncertainty.

Figure 4.3.7a.

Question 7: How concerned are you about the state of our environment today?

There were significant but weak differences between the three groups.

$\chi^2(8)=28.082$;
 $p=.000$
 Cramer's V=
 .156

N=1154

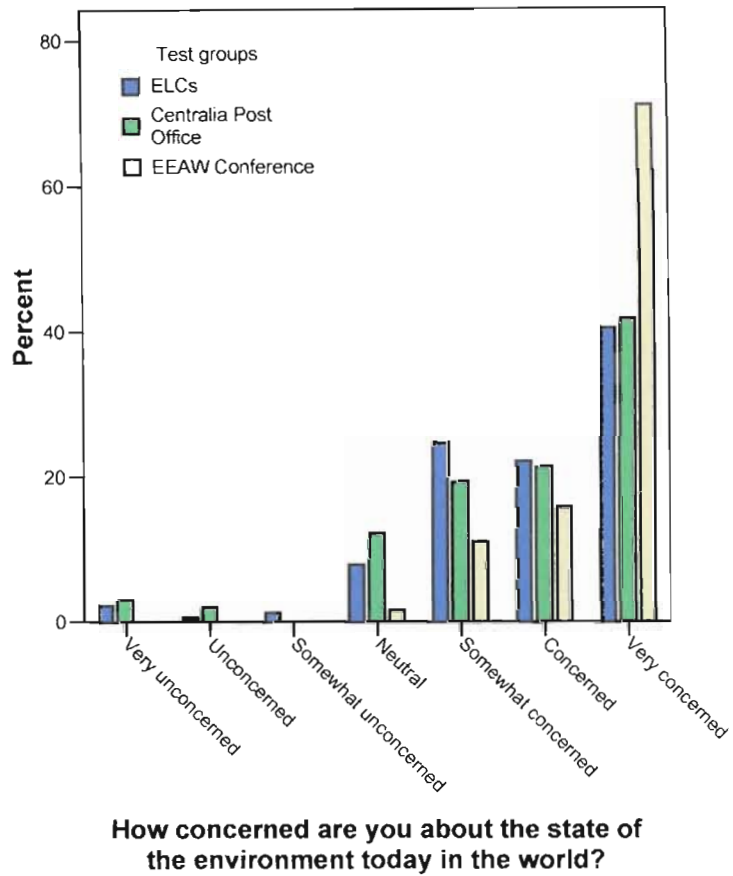


Figure 4.3.7b.

There were significant but weak differences between the three groups.

$\chi^2(8)=27.681$;
 $p=.001$
 Cramer's V=
 .109

N=1155

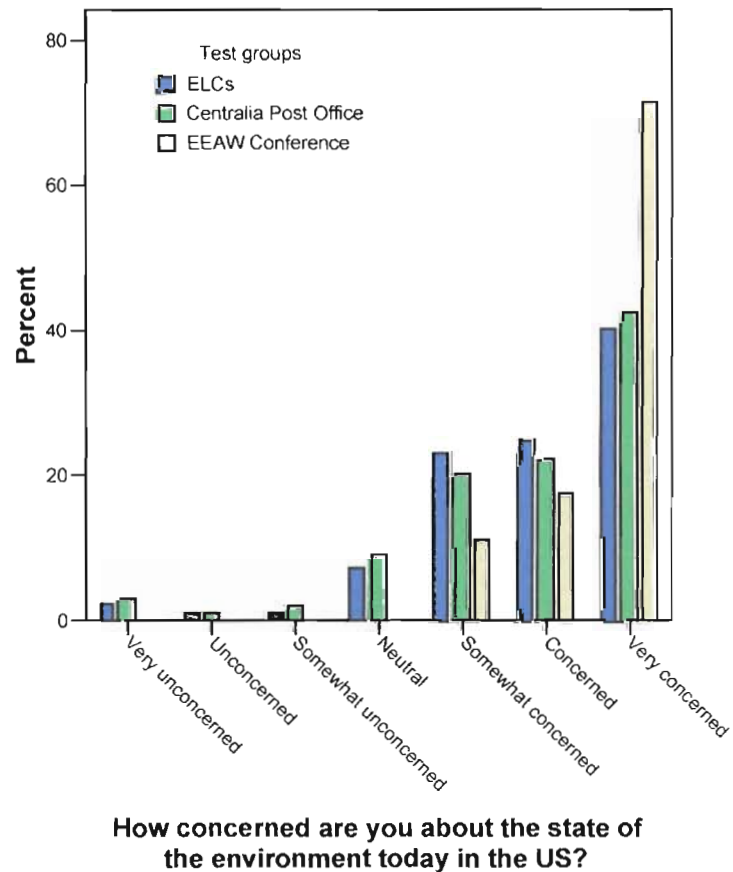


Figure 4.3.7c.

There were significant but very weak differences between the three groups.

$\chi^2(8)=21.614$:
 $p=.008$
 Cramer's V=
 .095

N=1145

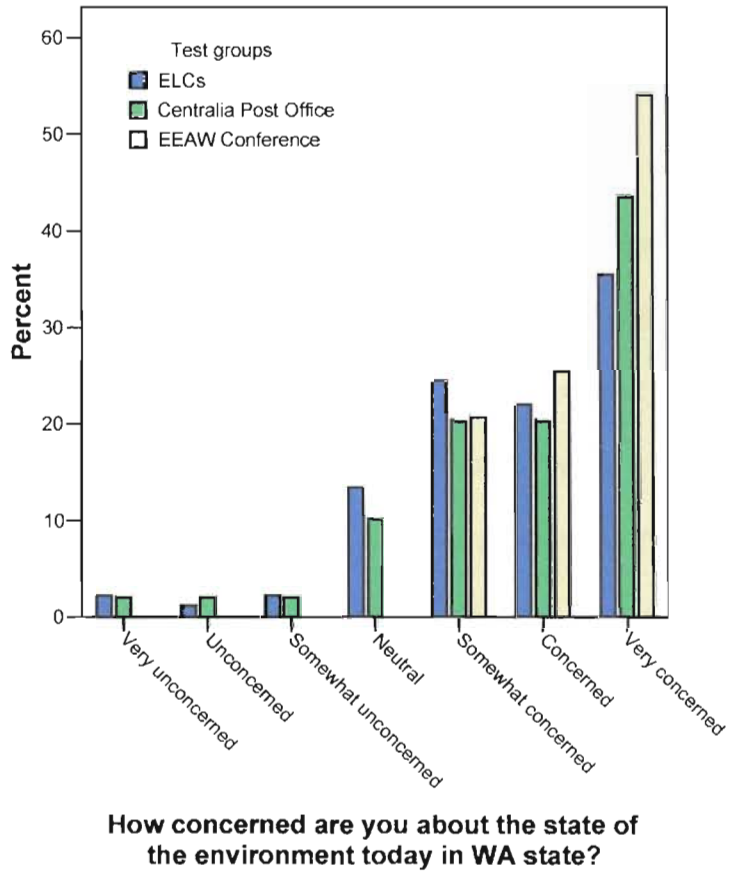
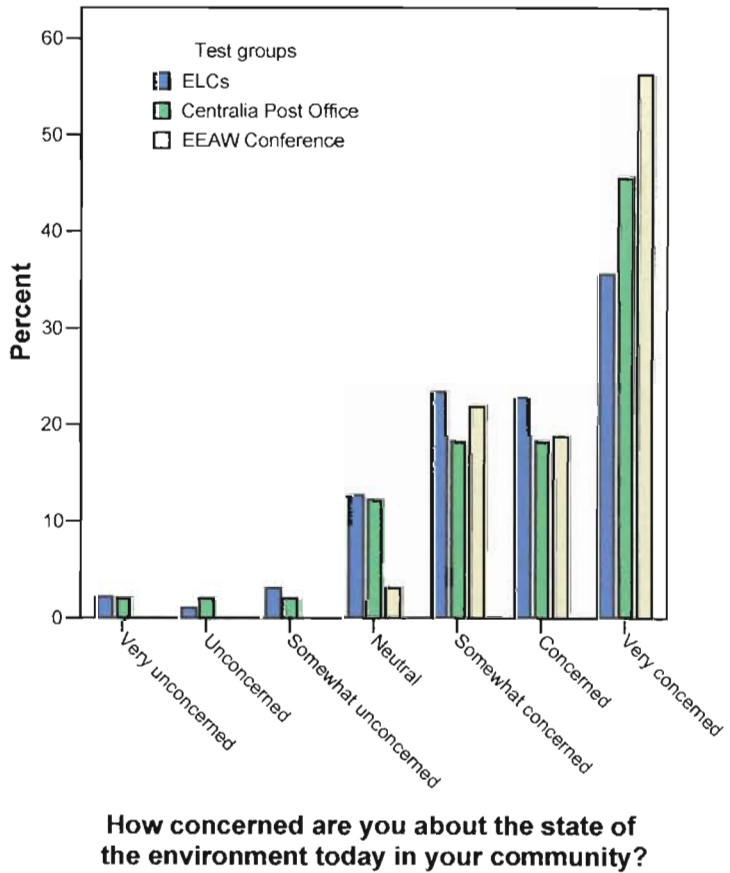


Figure 4.3.7d.

There were significant but very weak differences between the three groups.

$\chi^2(8)=19.528$:
 $p=.012$
 Cramer's V=
 .092

N=1156



Question 8

With the exception of one question, respondents generally agreed or strongly agreed with the claims in Question 8. While the pattern of stronger support for EE claims was still evident across all groups, there were two questions that elicited mixed responses. Thirty to forty percent of respondents expressed uncertainty regarding Question 8(a), “How important is EE in helping students perform better in school?” See Figure 4.3.8-A. Question 8(e), “How important is EE in helping young people take care of themselves outdoors,” drew high levels of support, but support was widely distributed as indicated in Figure 4.3.8-E.

Figure 4.3.8-A

Question 8: Indicate How important the role of EE is in helping to meet the following needs of children/young people today?

There were significant but weak differences between the three groups.

$\chi^2(12)=103.375$:
 $p=.000$
 Cramer's $V=.211$

$N=1157$

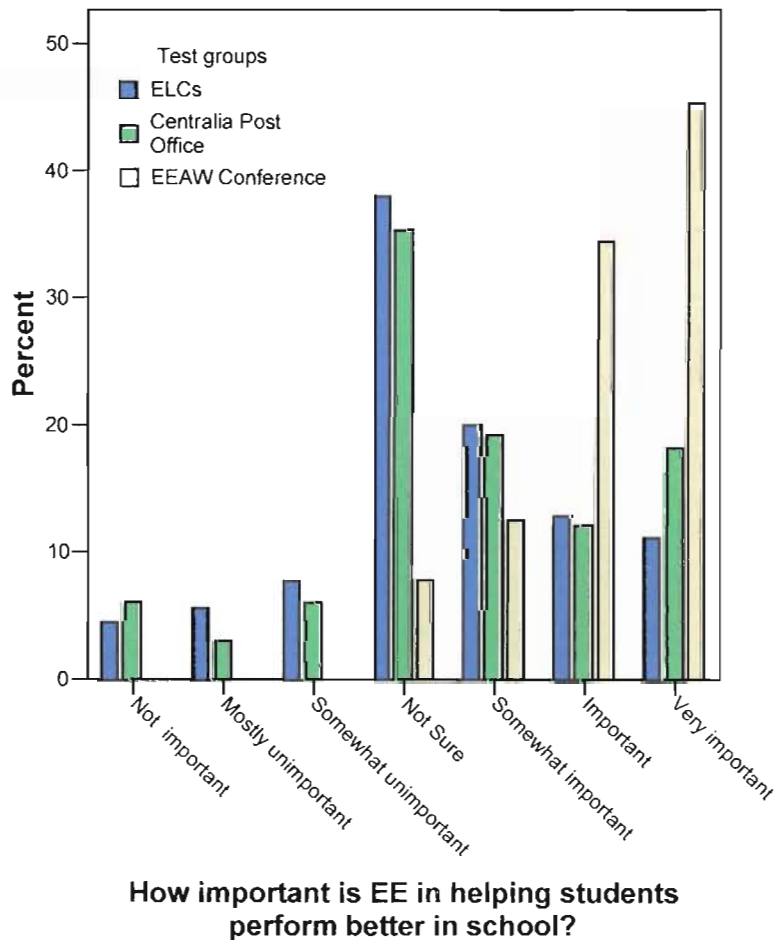
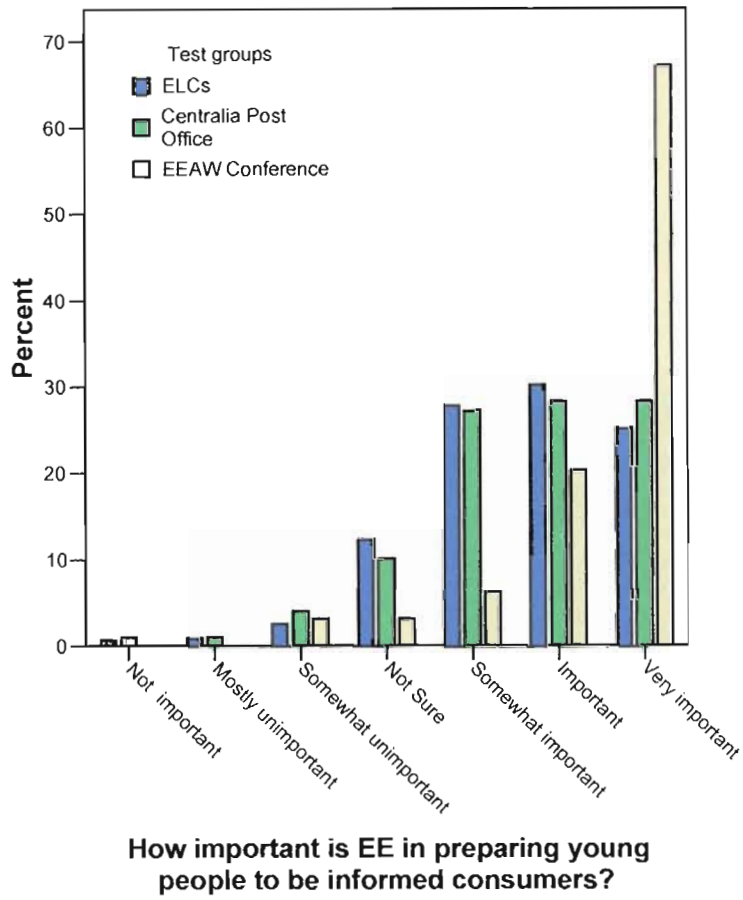


Figure 4.3.8-B

There were significant but weak differences between the three groups.

$\chi^2(8) = 56.412$:
 $p = .000$
 Cramer's $V = .156$

$N = 1159$



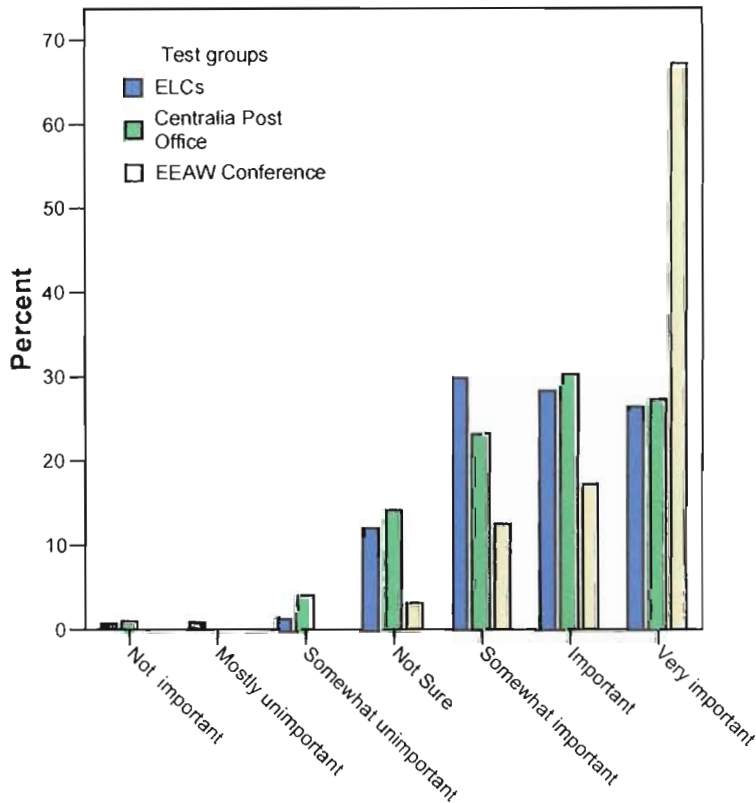
How important is EE in preparing young people to be informed consumers?

Figure 4.3.8-C

There were significant but weak differences between the three groups.

$\chi^2(8) = 52.848$:
 $p = .000$
 Cramer's $V = .151$

$N = 1158$



How important is EE in preparing young people to feel connected to their community through service projects?

Figure 4.3.8-D

There were significant but weak differences between the three groups.

$\chi^2(8)=29.702$:
 $p=.000$
 Cramer's V=
 .113

N=1158

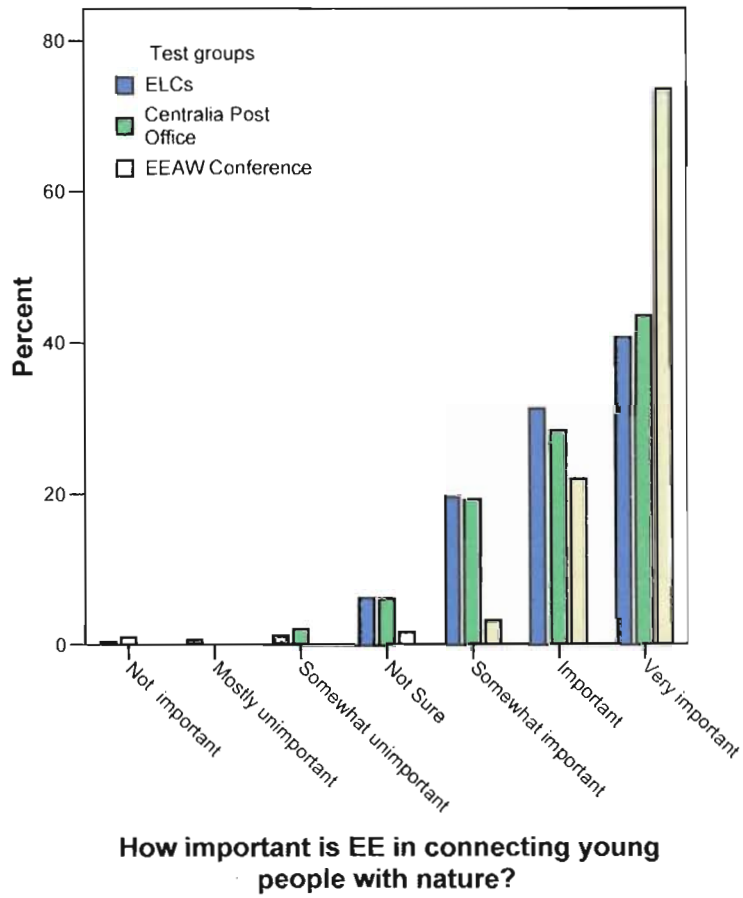


Figure 4.3.8-E

There were no significant differences between the three groups.

$\chi^2(8)=8.057$:
 $p=.428$
 Cramer's V=
 .059

N=1160

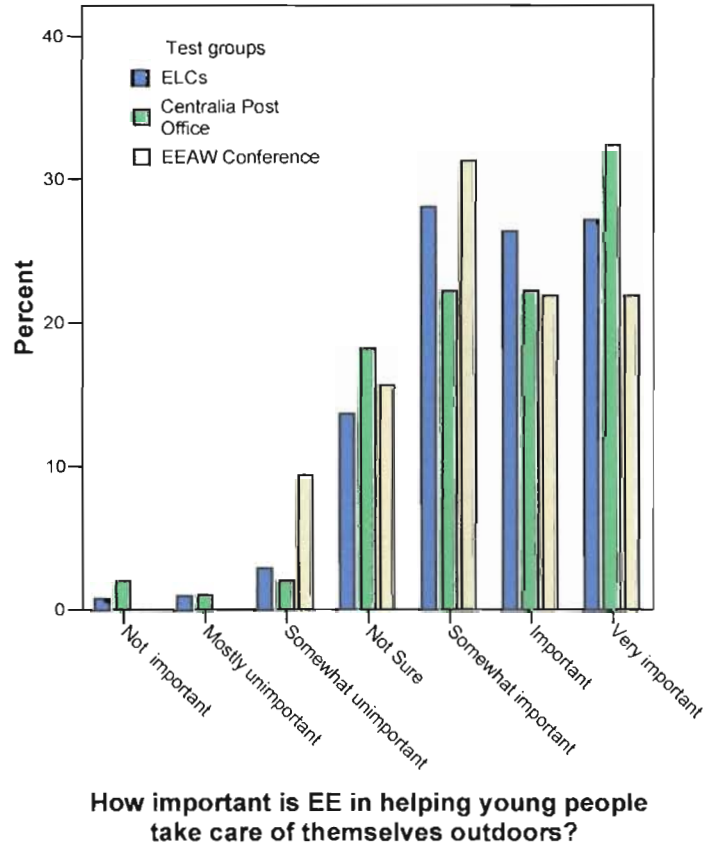


Figure 4.3.8-F

There were significant but weak differences between the three groups.

$\chi(8)=23.184$
 $p=.003$
 Cramer's V=
 .100

N=1159

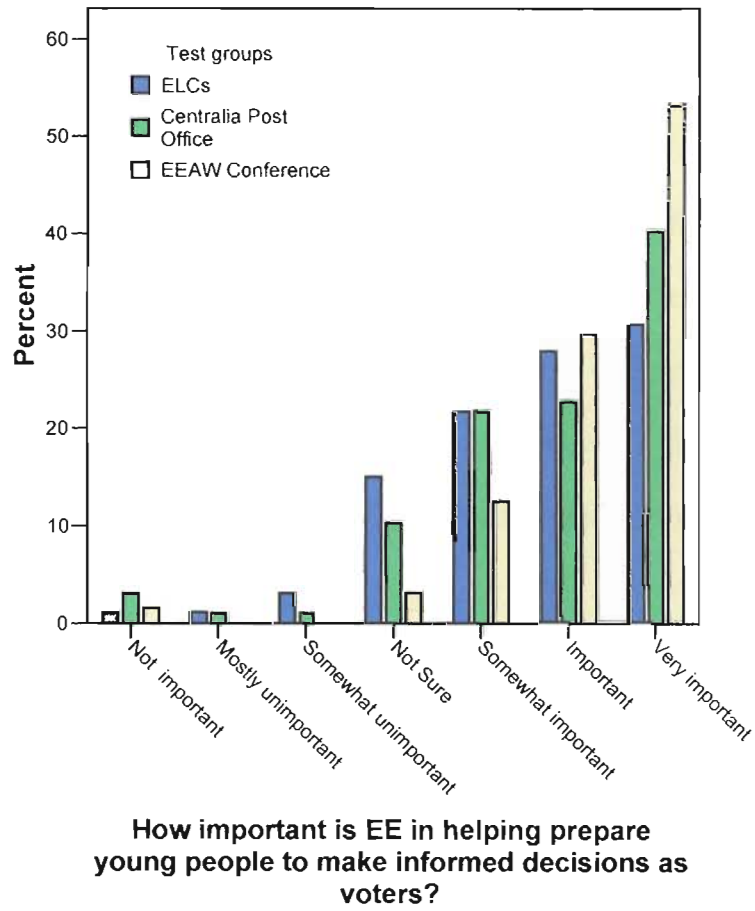
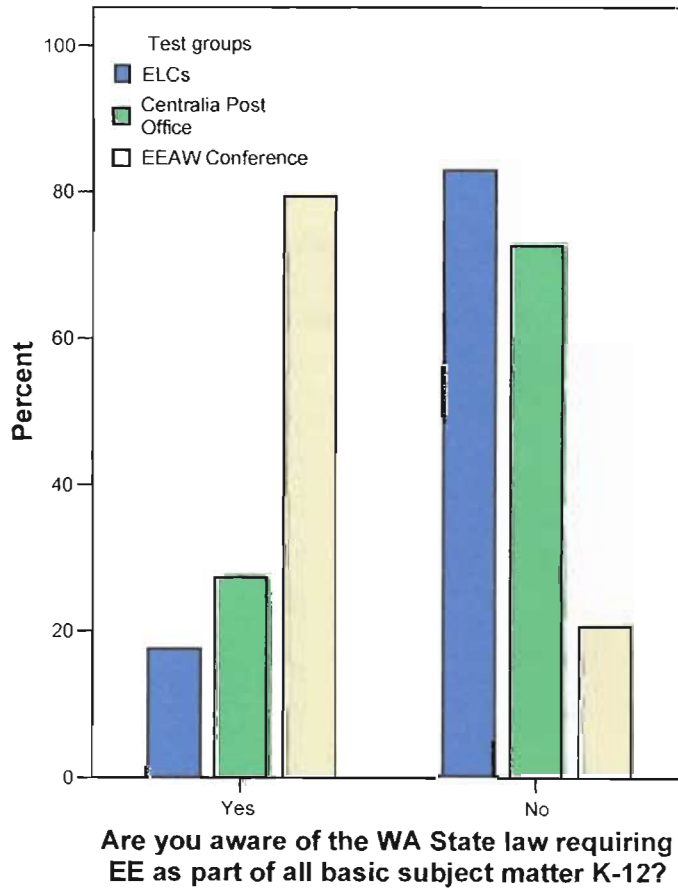


Figure 4.3.9.

There were significant differences between the three groups.

$\chi^2(2)=135.493$:
 $p=.000$
 Cramer's V=
 .351

N=1009



Question 9

As shown in Figure 4.3.9, there were strong differences between the three groups for the question, “Are you aware of the Washington State law requiring EE as part of all basic subject matter K-12?” While 80% of the EEAW respondents were aware of the mandate for EE in the State of Washington, only 24% of respondents from the Centralia Post Office and 17% of respondents from the Environmental Learning Centers were aware of this mandate.

Summary of Comparisons of Environmental Learning Center Group with the Centralia Post Office and the Environmental Education Association of Washington Conference Groups

Results from the survey were consistent throughout. There was a very high level of support for environmental education by each of the three test groups for each of the claims tested. Responses from the EEAW Conference group indicated the highest levels of support for the EE claims throughout the survey. However, responses from the ELC and CPO groups were very similar and also consistently high. There were no moderate or high levels of disagreement for any of the claims tested in Questions 3-8, but there were relatively higher levels of uncertainty for some of the claims among the ELC and CPO groups.

Evaluation of Hypotheses

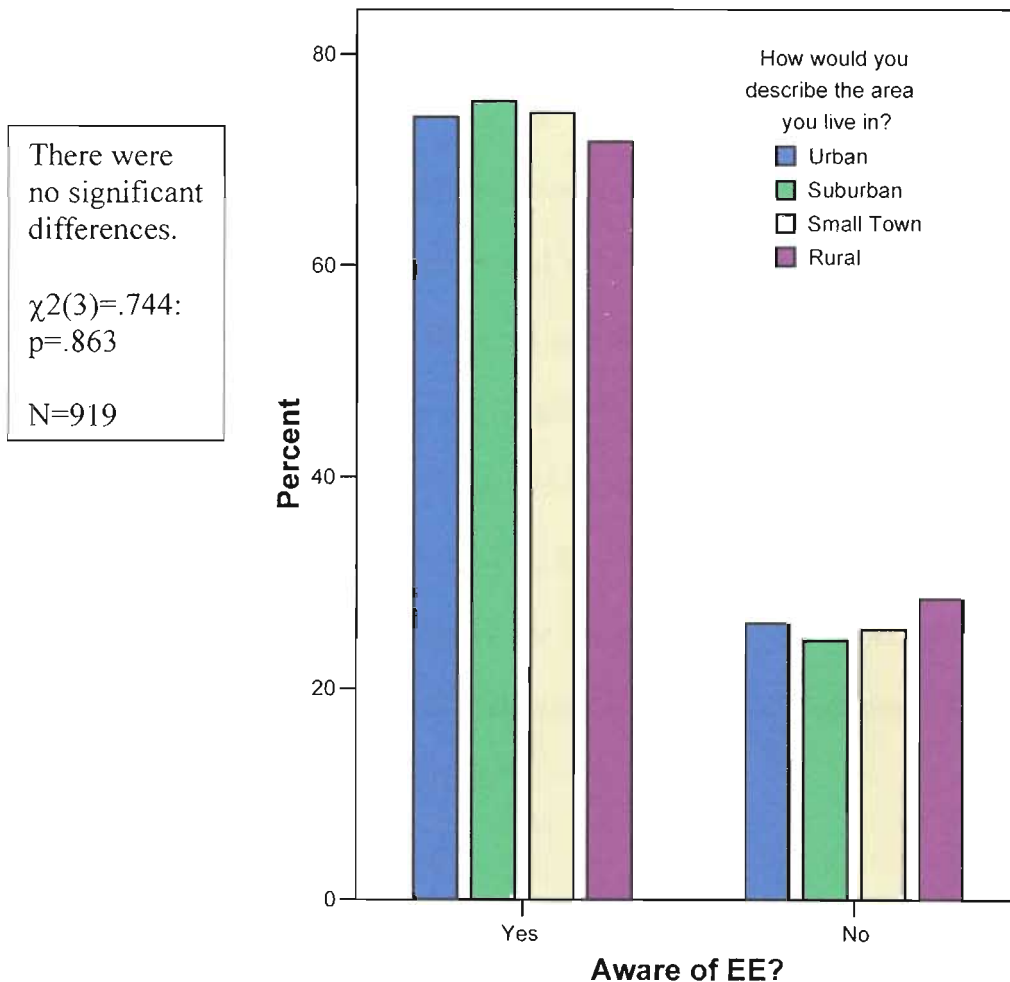
Hypotheses are based on Environmental Learning Center group respondents.

Hypothesis 1: There is a significant difference in awareness of EE based on where people live.

(Question 1: Were you aware that there is a field of study known as environmental education? and Question 16: Describe the area that you live-urban, suburban, small town, rural.)

As indicated in Figure 4.4.1, based on the chi-square test there are no significant differences in people's awareness of EE based on where they live. No matter where ELC respondents lived, 25% of them said they were *not* aware of EE as a field of study.

Figure 4.4.1.



Hypothesis 2: There is a positive correlation between the levels of exposure to EE and degrees of concern about the state of the world, the United States, Washington State, and local communities.

(Question 4: Environmental Learning Sources A+B and Question 7: How concerned are you about the state of our environment today: A. in the world, B. in the United States, C. in Washington State and D. in your community.)

To calculate the levels of exposure used in this hypothesis, the results from the frequency table in Questions 4A and 4B were added together. The highest possible score for each “environmental learning source” was three points. There were 22 environmental learning sources queried for “as a child” and 22 for “currently as an adult.” Totaling the scores from 4A and 4B gave each respondent a score that ranged from 0 (no exposure whatsoever) to 132 (high level of exposure to every single source). These total scores were divided into quartiles and each quartile was given a number. The top 25% with the highest scores were assigned to quartile “1”, the second to quartile “2”, the third to quartile “3” and the bottom quartile received a score of “4.”

These scores were then correlated with reported levels of concern for the world, the U.S., Washington State and the local community. Spearman’s rho test was used and the significance was based on $p < .05$ (2-tailed).

While nearly everybody reported moderate to high degrees of environmental concern, the graphs, (see Figures 4.4.2-A, B, C and D), do indicate that the top quartile of exposure frequency generally shows the highest degree of concern for all four areas surveyed while the lowest quartile shows the least. Although these differences were small, they are statistically significant.

Figure 4.4.2-A.

rho(world) =
.176:
p=.000
N=993

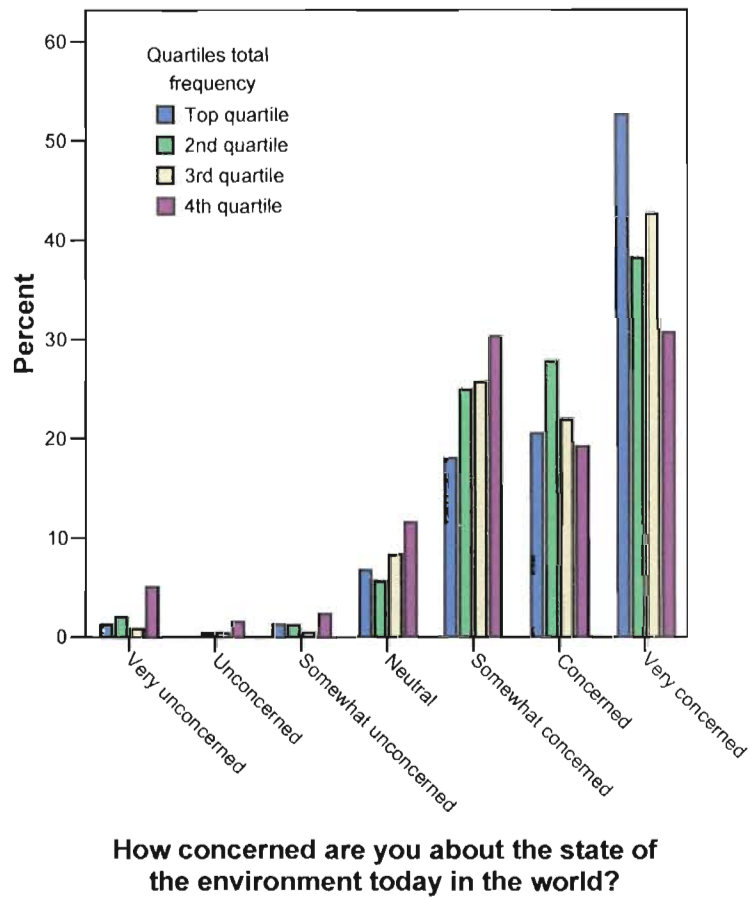


Figure 4.4.2-B.

rho(US)=.190:
p=.000
N=993

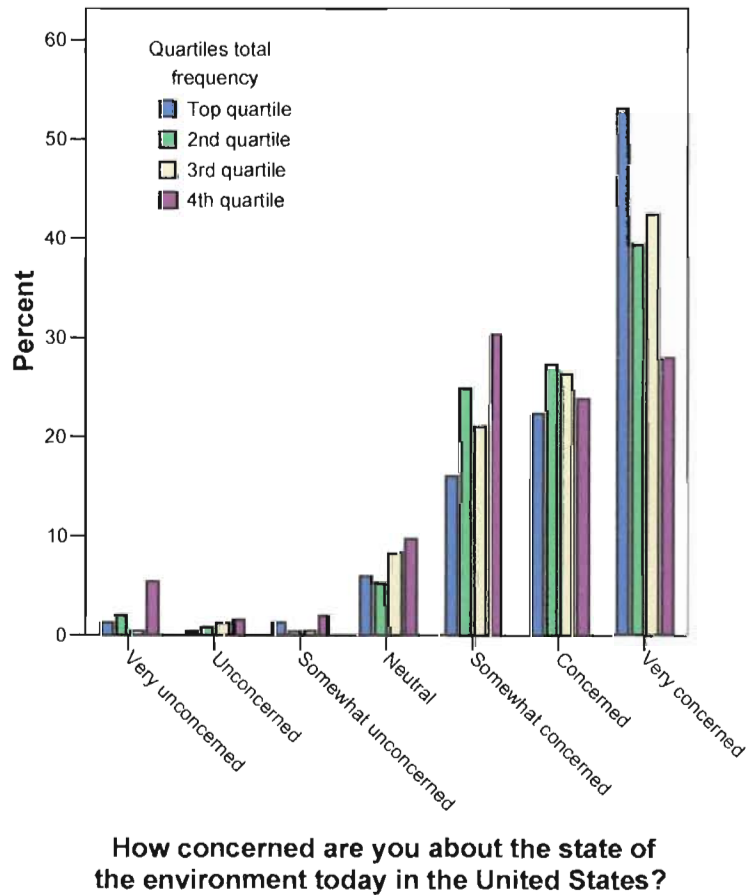
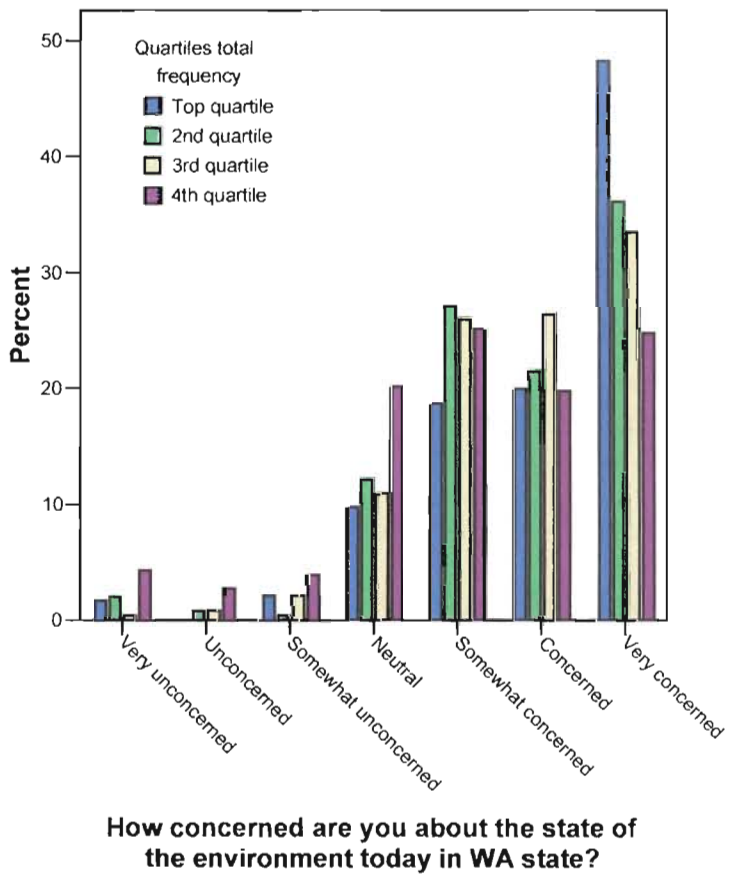


Figure 4.4.2-C.

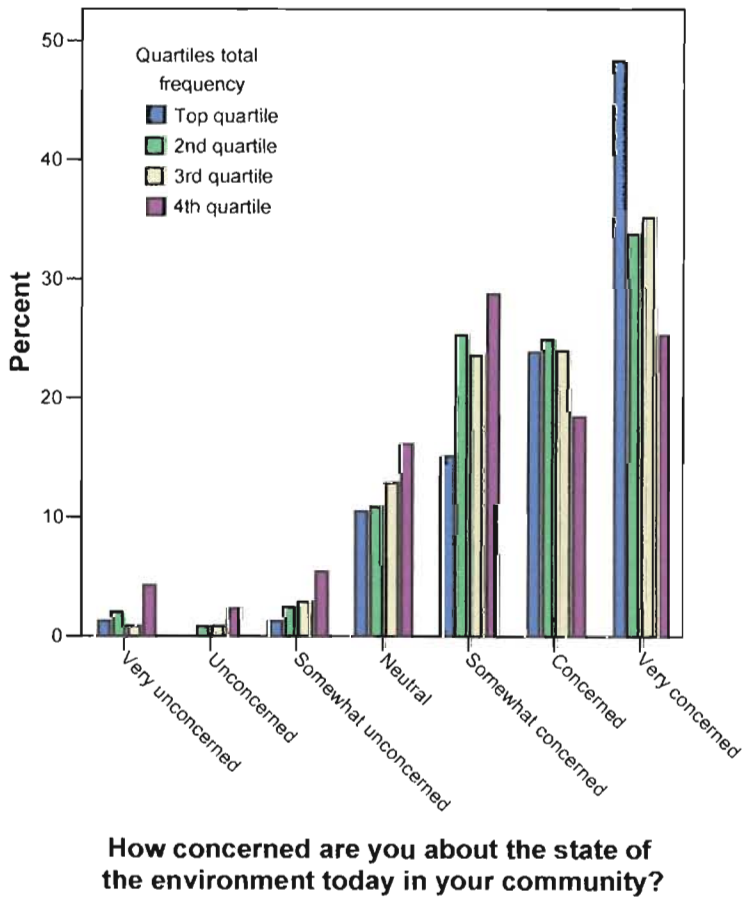
rho (WA)=.196:
p=.000
N=983



How concerned are you about the state of the environment today in WA state?

Figure 4.4.2-D.

rho(community)=.203:
p=.000
N=993



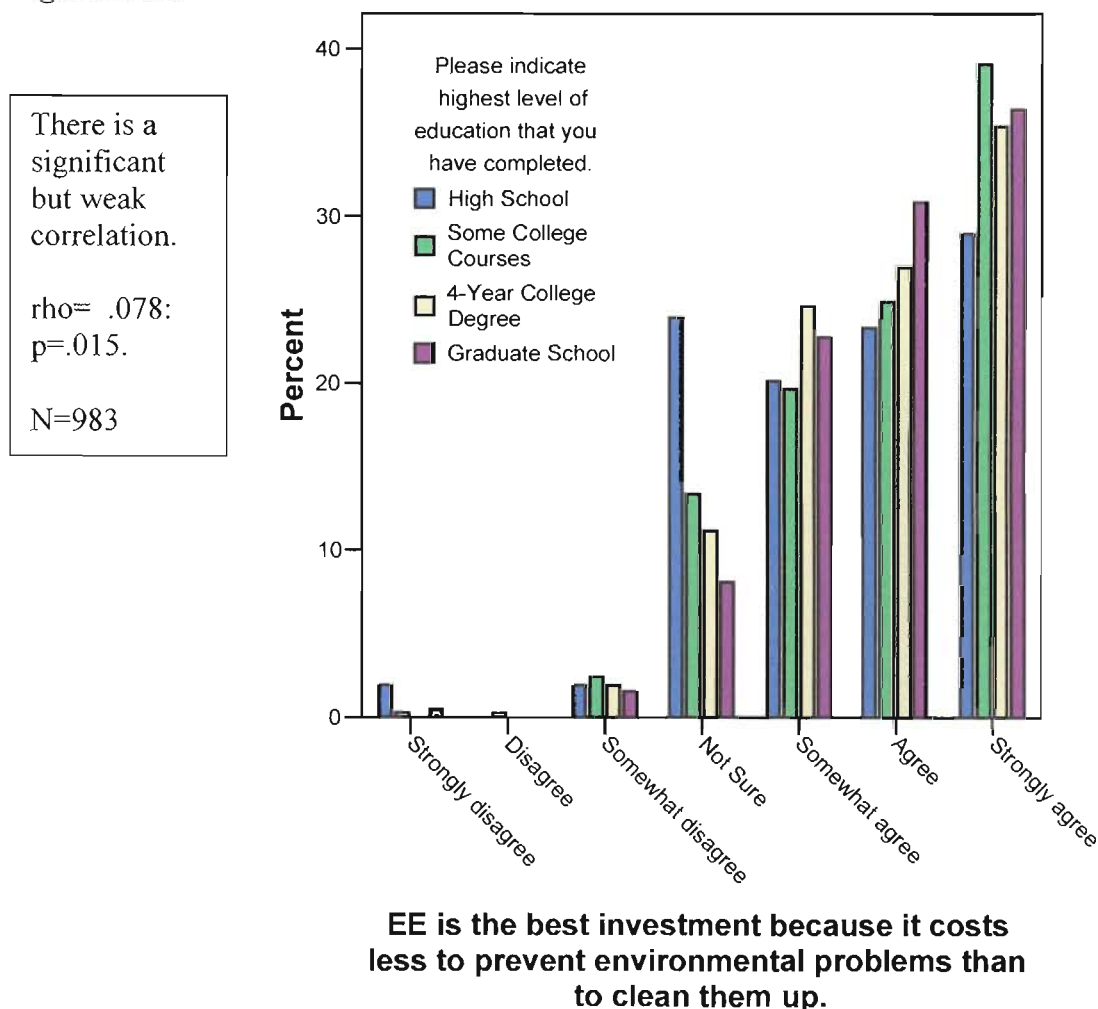
How concerned are you about the state of the environment today in your community?

Hypothesis 3: Higher levels of education can be correlated with the statement that “It costs less to prevent environmental problems than to clean them up.”

(Question 6(a): EE is the best investment because it costs less to prevent environmental problems than to clean them up and Question 13: Please indicate the highest level of education you have completed: high school, some college courses, 4-year college degree, and graduate school.)

As revealed in Figure 4.4.3, there was a significant but very weak correlation between level of education and agreement with the statement, “It costs less to prevent environmental problems than to clean them up.” It should be noted that respondents with just a high school education seemed to be much less sure than those with higher education as to whether they agreed with this statement or not. ELC respondents with some college courses or higher agreed more strongly with this statement.

Figure 4.4.3.



Hypothesis 4: There is a significant difference between occupation and whether or not people support the statement “EE should be a central goal in public school education.”

(Question 6(f) EE should be a central goal in public school education, and Question 12: Please describe your occupation.)

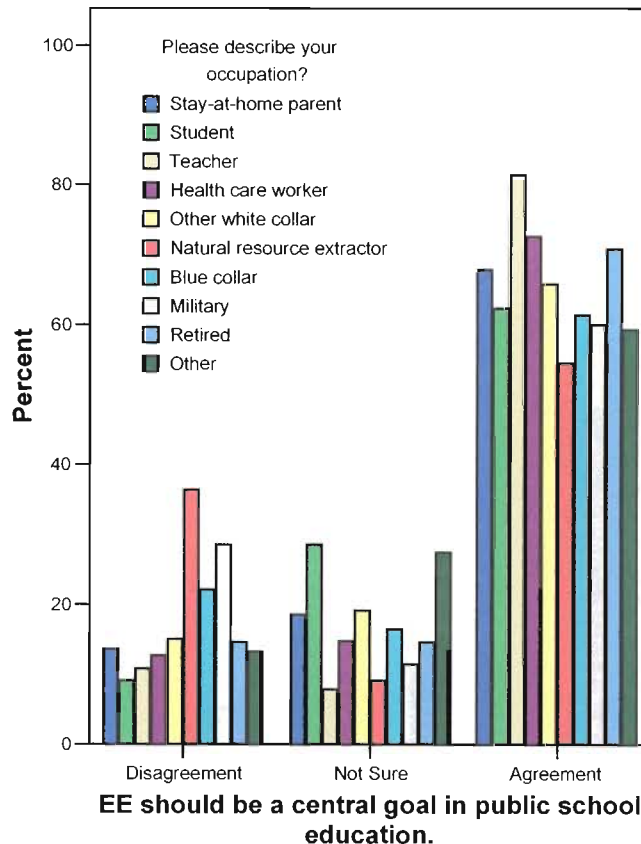
As displayed in Figure 4.4.4, there were no significant differences between respondents’ occupations and support for “EE should be a central goal in public school education.” While natural resource extractors showed some notable differences, the number of resource extractors in the survey was too low to be significant. The data for this graph were collapsed twice in order to make it easier to read and see any differences since there were so many bars, one for each occupation. This means that all disagreeing responses were lumped together and all agreeing responses were lumped together. Simply stated, 66% of ELC respondents of *all* occupations supported the statement, “EE should be a central goal in public school education.”

Figure 4.4.4.

There were no significant differences between the occupations.

$\chi^2(18)=$
28.549:
 $p=.054$

N=925



Hypothesis 5: There is a significant difference in how people view themselves politically and their response to the statement “National, state and local governments should support and fund EE programs.”

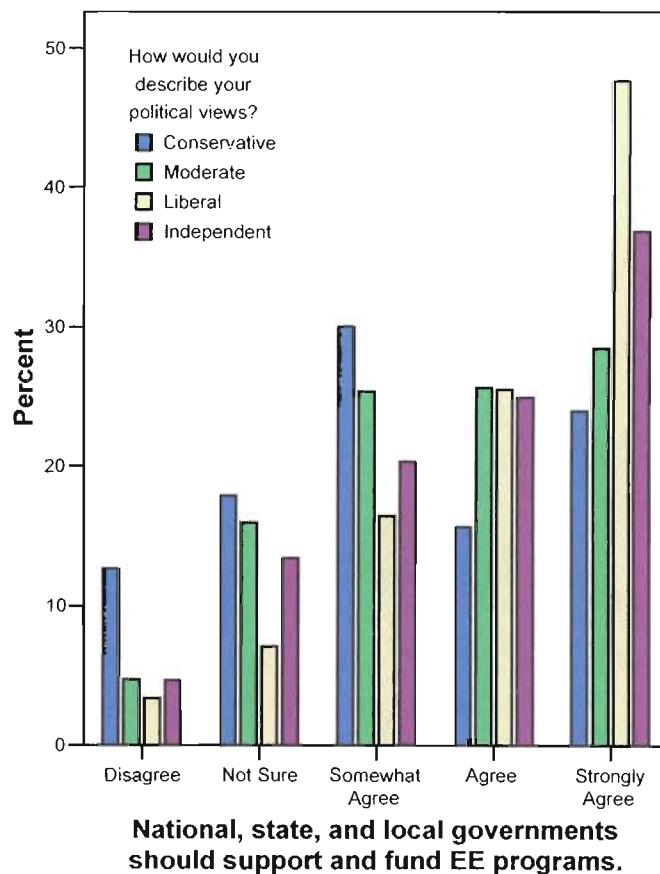
(Question 15: How would you describe your political views? conservative, moderate, liberal, or independent, and Question 6(m): National, state and local governments should support and fund EE programs.)

As indicated in Figure 4.4.5, there does appear to be a significant but weak difference between how people view themselves politically and their response to government funding of EE programs. In this graph disagreeing respondents who answered “1, 2, or 3” had their data grouped together because the number of respondents were too low to employ the chi square test otherwise. Respondents with a “liberal” perspective tended to show more support for government funding of EE programs while “conservatives” showed more uncertainty and slightly more disagreement with this claim. As a group, 80% of ELC respondents supported national, state and local funding of EE programs.

Figure 4.4.5.

There were significant differences between the three groups.
 $\chi^2(12)=55.839$:
 $p=.000$
 Cramer’s V=
 .142

 N=920



Hypothesis 6: There is a significant difference in response to “EE is not urgently needed now,” by people who live in different areas.

(6(l) EE is not urgently needed now, and 16: Would you describe the area you live in as: urban, suburban, small town and rural.)

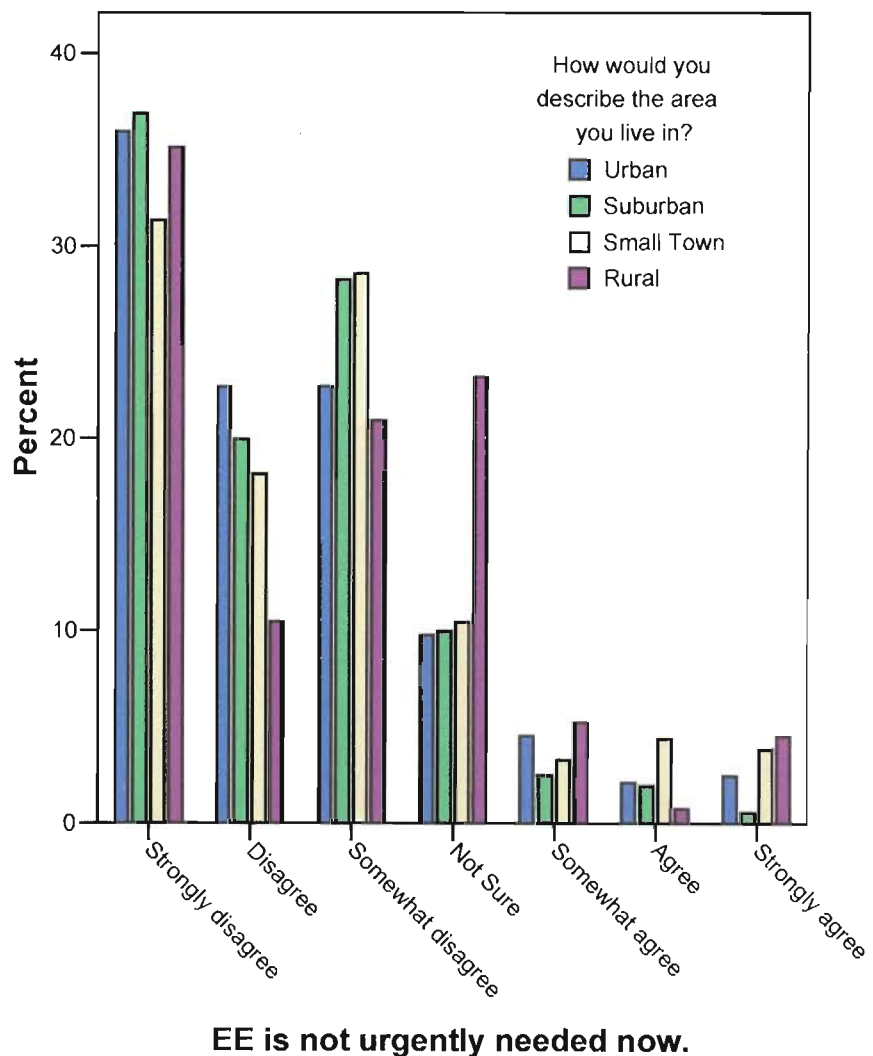
As revealed in Figure 4.4.6, there does appear to be a significant but weak difference between where people live and how they respond to “EE is not urgently needed now.” People in rural areas had considerably more uncertainty about this statement than the people living in the other three areas. Eighty percent of all respondents from the ELC group disagreed with this statement.

Figure 4.4.6.

There were significant differences between respondents from different areas.

$\chi^2(18)=46.726$:
 $p=.000$
 Cramer's
 $V=.127$

N=964



Hypothesis 7: There is a significant difference in level of community involvement and support for the statement, “EE helps young people feel connected to their community through service projects.”

(Question 8©: Helps young people feel connected to their community through service projects, and Question 17: How would you rate your level of community involvement?)

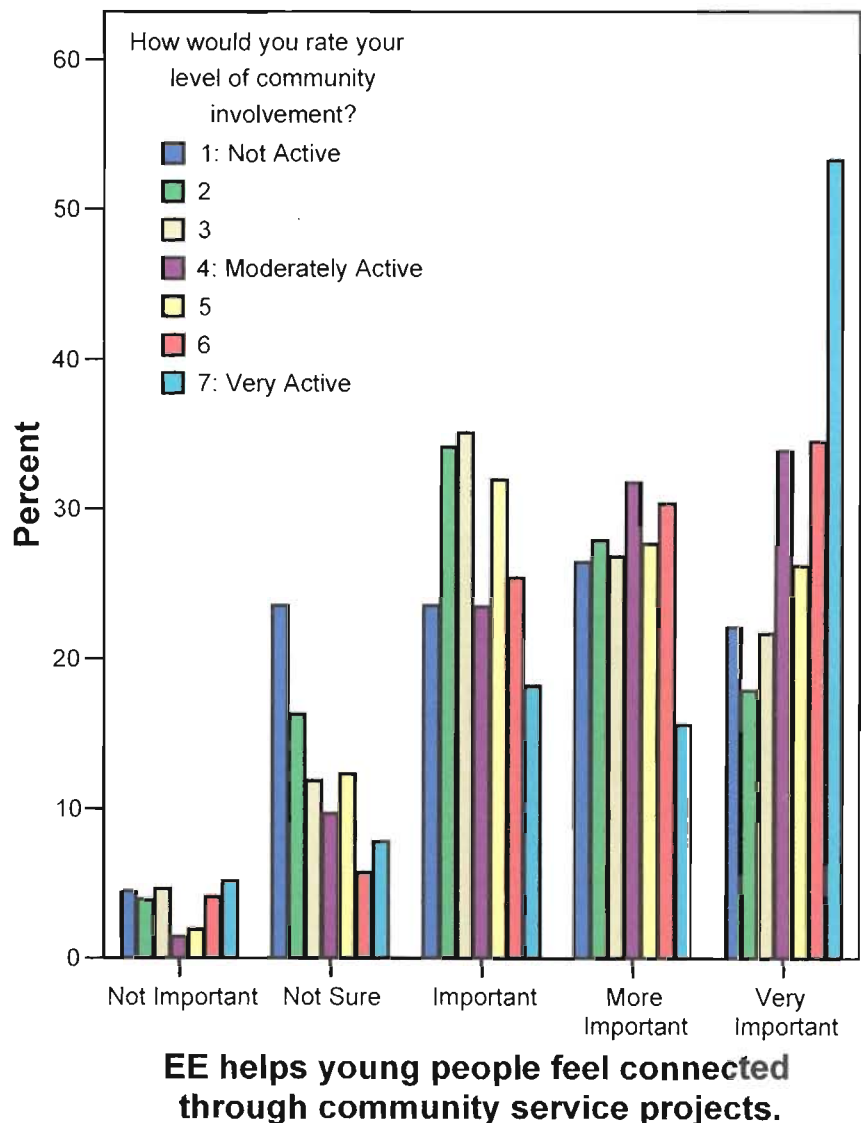
As indicated in Figure 4.4.7, there is a positive but weak correlation between respondents who supported the statement “EE helps young people feel connected in their community through community service projects,” and their reported level of community involvement. ELC respondents who were very active in their communities displayed the highest level of agreement with this statement.

Figure 4.4.7.

There was a significant but weak correlation.

$\rho = .129$;
 $p = .000$

N=980



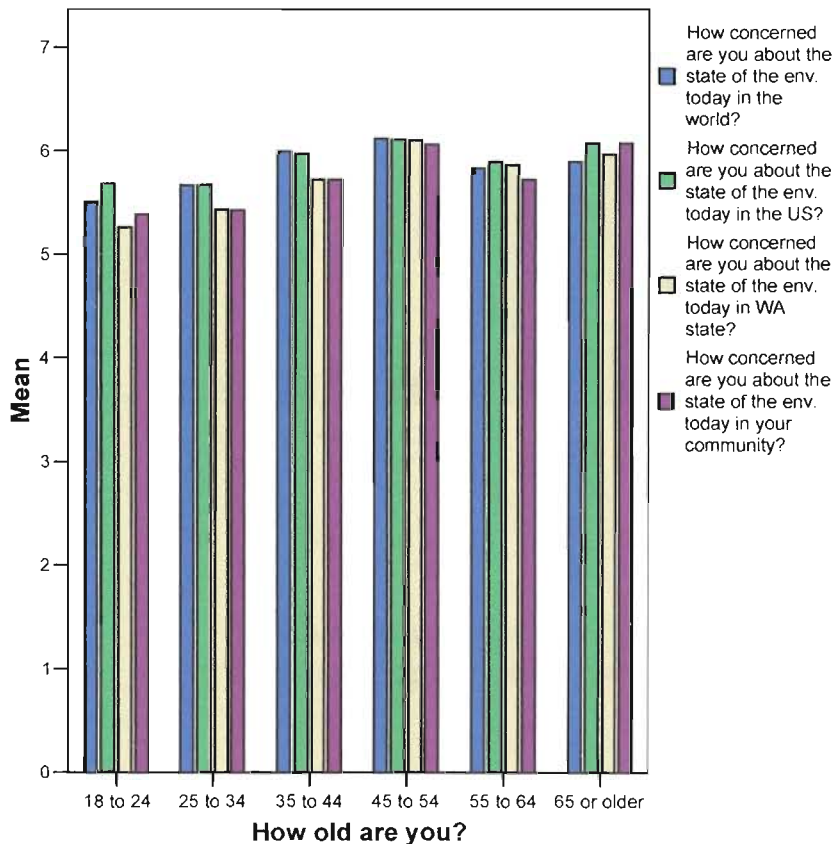
Hypothesis 8: There is a significant difference in age and levels of concern about the world, the U.S., and state and local communities.

(Question 7: How concerned are you today about the state of the environment in the world, in the U.S., in Washington State and in your community? and Question 11: How old are you?)

As demonstrated in Figure 4.4.8, age of ELC respondents is positively correlated to levels of concern about the world, the U.S., state and local communities. This means that the older age groups show slightly more concern for the state of our environment in our world, the U.S, Washington State and their local communities than the younger groups. However, the strength of the correlation is weak between age and level of concern for all four geographical scales, which means that the differences between the age groups are small.

<i>rho(world)=</i>	.146; p=.000	N=991
<i>rho(US)=</i>	.121; p=.000	N=990
<i>rho(state)=</i>	.195; p=.000	N=981
<i>rho(community)=</i>	.173; p=.000	N=991

Figure 4.4.8.



Hypothesis 9: There are significant differences between gender and support for the statement: EE challenges learners to understand different perspectives on complex issues.

(Question 6 (k): EE challenges learners to understand different perspectives on complex issues and Question 10: I am a Female b Male)

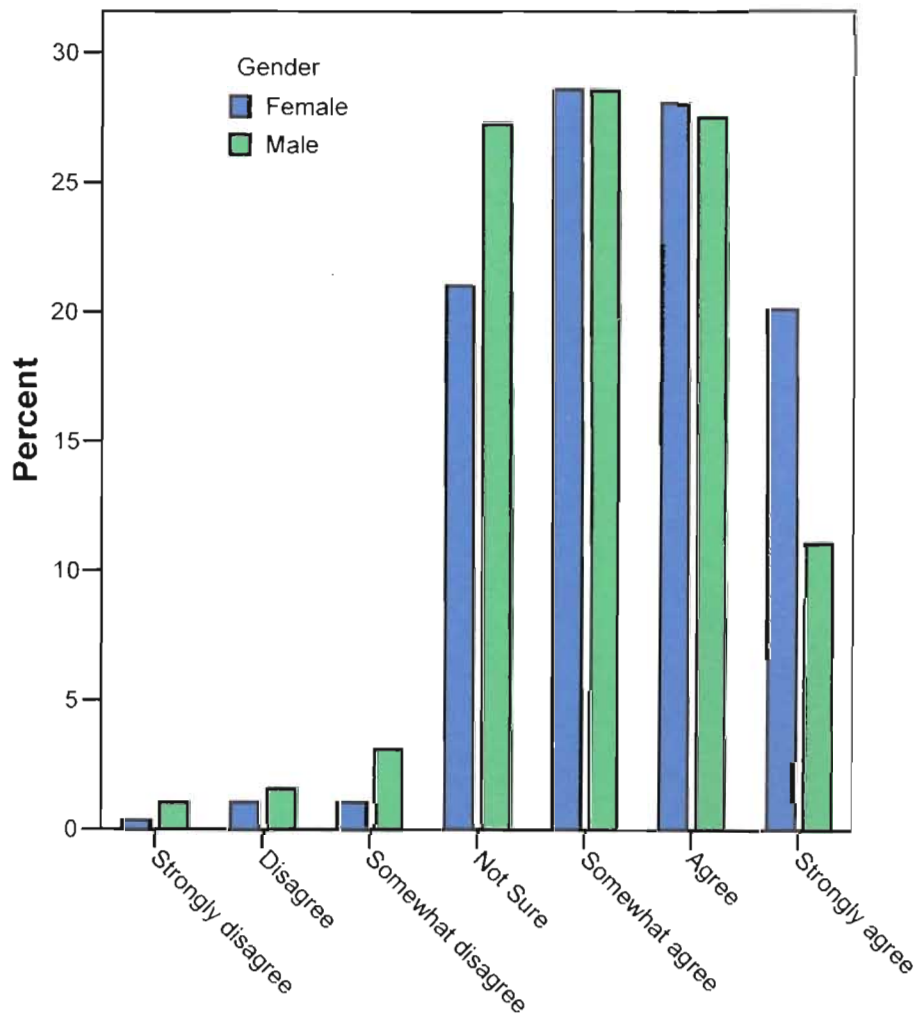
As seen in Figure 4.4.9, significant but weak differences were found between male and female responses to this question. Female ELC respondents showed a little more support for this claim while male ELC respondents indicated a little more uncertainty.

Figure 4.4.9.

There were significant but weak differences between males and females.

$\chi^2(6)=23.101$:
 $p=.001$
 Cramer's $V=.154$

$N=971$



EE challenges learners to understand different perspectives on complex issues.

Hypothesis 10: There is a significant difference between occupations and support for the role of EE in “Helping to maintain a healthy environment for people to live.”

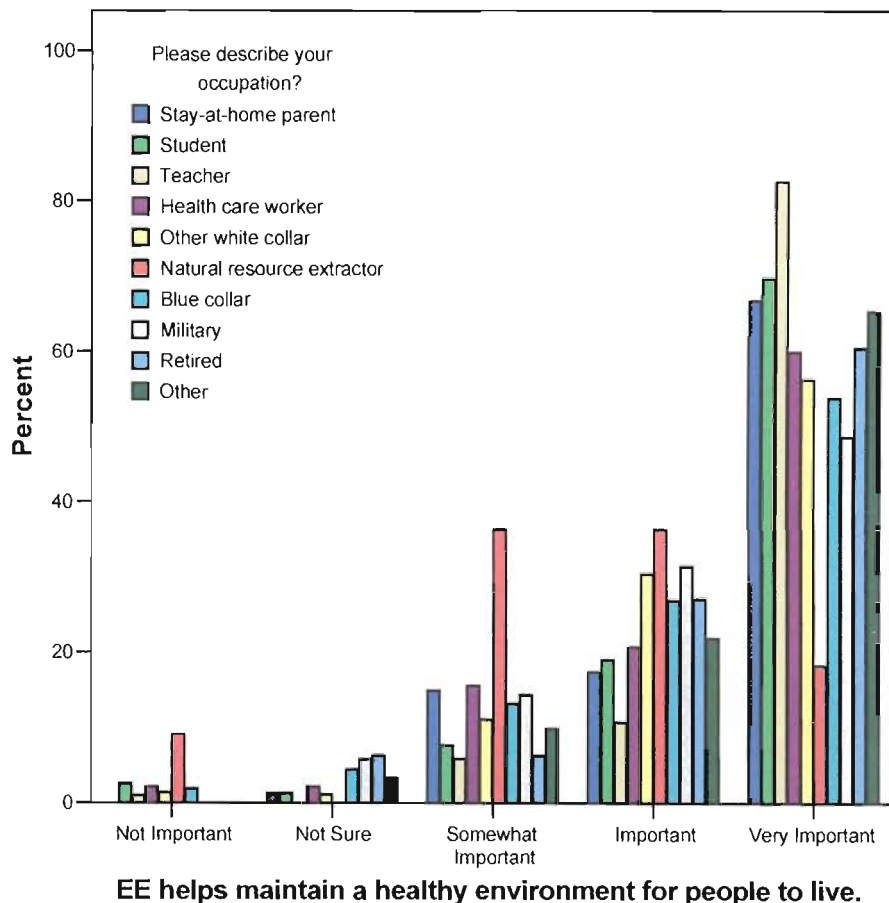
(Question 5(b). Helps maintain a healthy environment for people to live in, and 5(b): Question 12. Please describe your occupation.)

As revealed in Figure 4.4.10, there are no significant differences between occupations and responses to “EE helps to maintain a healthy environment for people to live.” While natural resource extractors were not as supportive as the rest of the occupations tested, their sample size was too low to be significant. Teachers showed the highest level of support for EE overall followed by students and stay-at home parents. In this analysis, the disagreeing responses had to be lumped together since the levels of disagreeing responses were too low to use the chi square analysis. Ninety-six percent of all ELC respondents of all occupations support this claim.

Figure 4.4.10.

There are no significant differences between occupations.

$\chi^2(4) = 7.031$
 $p = .134$
 $N = 870$



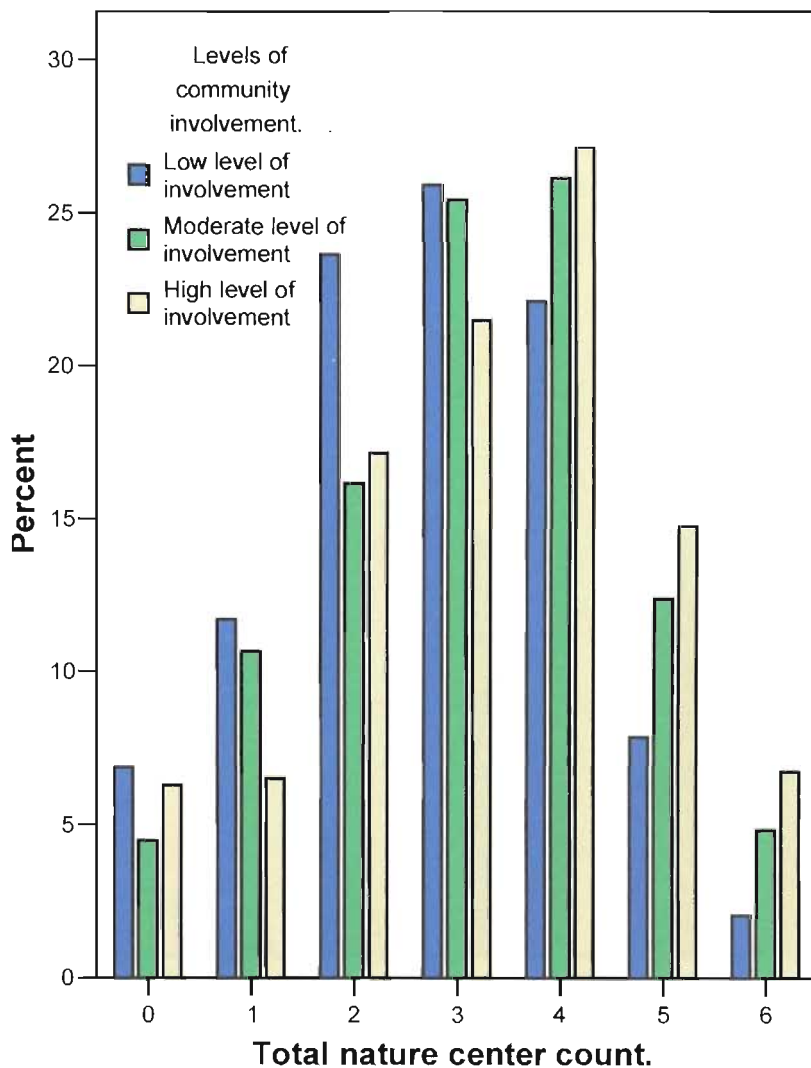
Hypothesis 11: There is a significant difference between level of exposure to nature centers and reported level of community involvement.

(Question 4 A+B: Level of exposure to nature centers, and Question 17: How would you rate your level of community involvement?)

As displayed in Figure 4.4.11, there was a positive but weak correlation between level of exposure to nature centers as a child and as an adult combined and reported the level of community involvement. Scores for exposure frequency ranged from “0” to “6” with 6 being the most exposure. Greater exposure to nature centers was related to a higher reported level of community involvement.

Figure 4.4.11.

There was a significant but weak correlation.
 $\rho = .144$:
 $p = .000$
 $N = 986$



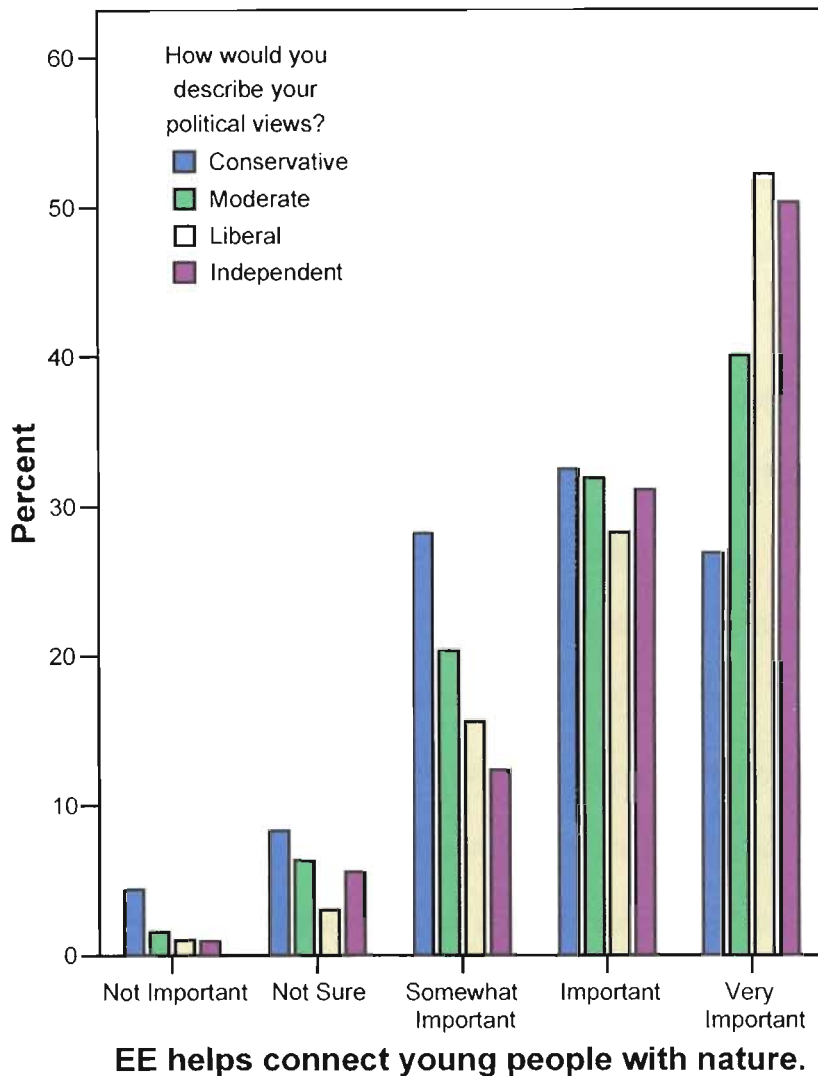
Hypothesis 12: There is no significant difference between people of different political persuasions and support for the idea that EE connects children with nature.

(Question 8(d): EE helps connect young people with nature, and
 Question 15: How would you describe your political views? conservative, moderate, liberal, and independent)

As Figure 4.4.12 indicates, there are significant but weak differences in the responses by people of different political views with support for the statement, “EE connects children with nature.” Conservatives again showed more uncertainty while liberals and independents showed higher levels of support for this claim. Overall, 92% of respondents to ELCs supported this claim.

Figure 4.4.12.

There were significant but weak differences.
 $\chi^2(12)=43.482$:
 $p=.000$
 Cramer's V=
 .125
 N= 923



Summary of Evaluation of Hypotheses

- ELC respondents were remarkably supportive of all of the EE claims presented in this study.
- Respondents from the different areas were equally aware of EE.
- Respondents with more exposure to EE as a child and as an adult also had higher levels of concern about the state of the environment in the world, the U.S., WA State, and in their local communities.
- Respondents having higher levels of education tended to agree more strongly with the idea that “EE is the best investment because it costs less to prevent environmental problems than to clean them up.” Respondents with just a high school education were significantly more uncertain about this claim.
- At high levels, people of all occupations equally supported “EE should be a central goal in public school education” and “EE helps maintain a healthy environment for people to live.”
- There were differences in how respondents viewed themselves politically and their degrees of support for government funding of EE. Liberals showed slightly higher levels of support for EE than conservatives, moderates and independents.
- Respondents from rural areas were less certain about whether “EE is urgently needed now” than were respondents from urban and suburban areas and small towns.
- Respondents who were active in their communities were more likely to support the claim “EE helps young people feel connected through community service projects.”
- Age was also correlated with levels of concern. Older respondents showed slightly more concern about the state of the environment than did younger respondents.

- Females showed slightly more support for “EE challenges learners to understand different perspectives on complex issues.”
- Exposure to nature centers as a child was positively correlated with a higher reported level of community involvement.
- There were slight differences in respondents of differing political views and support for the statement, “EE helps connect children with nature.” While most conservatives supported this claim, they did not rate it as important as did independent, moderate and liberal respondents.

Chapter Summary

Results from this study were consistent for all three groups surveyed. There was a strong support for environmental education both in formal and non-formal educational settings and little agreement with criticisms. This was true for people regardless of gender, age, occupation, level of education, political view, with children, grandchildren or childless, area of residence or level of community involvement. While some small differences were found among different demographic variables, support for EE was consistently positive.

CHAPTER 5

Discussion, Conclusions and Recommendations

Discussion

The results from this survey concerning the public's knowledge and attitudes toward environmental education were both surprising and enlightening. The results revealed consistent and highly supportive attitudes toward environmental education (EE) throughout each demographic variable tested. The survey design team attempted to come up with the most relevant claims, both positive and negative, regarding EE and the demographic variables that the team thought might make a difference in the support or non-support of EE. In Question 6 of the survey, there was support for every positive claim and an equally strong lack of support for all of the negative claims except for two that caused some disagreement and uncertainty.

Surveying visitors to environmental learning centers has its limitations since this group of respondents represent only one slice of the American public: those spending a weekend day visiting an environmental learning center. Because these centers charge admission fees, it can be assumed that the audience has discretionary money and time for recreation, and already has interests in an entertainment and educational experience with living things as opposed to spending the time in another leisure pursuit. A comparison was made with a small number of visitors to the Centralia Post Office, a post office in a small town in a rural Washington county that historically has voted more conservatively than more suburban and urban counties in the state. The surveys were invitational; potential respondents could decline taking the survey and many did. At most of the environmental learning centers one in four people who were asked to take the survey agreed to take it. At Wolf Haven nearly 100% of the visitors agreed to take the survey

because they stood around otherwise waiting for the tour to start. Rejection rates were highest at the Centralia Post Office because many people were running errands and indicated they did not have the time to take the survey. Roughly one of 10 people at the post office agreed to take the survey, so it took three visits to gather 100 surveys. Volunteers at Cat Tales in Spokane reported having good success in finding respondents to take the survey there but attendance was low.

We did succeed in gathering 286 surveys at Woodland Park Zoo, 204 from the Seattle Aquarium, 75 from Northwest Trek, 293 from Point Defiance Zoo and Aquarium, 38 from Port Townsend, 73 from Wolf Haven, 33 from Cat Tales, 99 from the Centralia Post Office, and 64 from the EEAW annual conference. Kathryn Owen from Woodland Park Zoo commented that our 286 surveys, gathered in a single afternoon, was a very high rate of return, especially for a four-page survey, considered by experienced surveyors to be a very long instrument. We were warned repeatedly that respondents would not take the time to complete a four-page survey. It was rather humbling to observe nearly all respondents carefully completing the surveys. In the entire study, no more than three- dozen surveys had to be placed in the recycle bin because they were insufficiently completed.

Because people paid fees to attend each of the environmental learning centers, and perhaps because of other reasons, there was a lack of diversity in range of income and culture among the respondents. It would have been beneficial to have a Spanish version of the survey to use at the Centralia Post Office, for at least a tenth of the visitors there were Hispanic. There were only a few Spanish-speaking visitors to the ELCs who turned down the survey because of the language barrier.

The Environmental Learning Center Respondent Group

It was interesting to discover that 26% of the ELC respondents were not familiar with the field of study known as environmental education. It is possible that they could have been thrown off by the phrase “field of study” since many might think of EE only as a practice, not a “field of study.” Initially we considered using the phrase, “field of study and practice” in the survey, but “and practice” was inadvertently dropped along the way. That one quarter of the respondents were unaware of EE was higher than expected. Fifty-five percent of respondents, however, said they could explain what EE is to a friend moderately well or better.

The four parts of Question 3 attempted to elicit the depth of knowledge of EE that respondents acquired as children or teenagers. Results from the ELC group showed that an equal number of respondents (82%) learned about both the natural environment and about environmental problems. However, a smaller percentage (75%) learned about preventing environmental problems and 70% learned about ways to clean up environmental problems. These results were roughly what we expected because learning about ways of preventing and cleaning up environmental problems necessitates the teaching of critical thinking skills in the context of complex political and economic issues, which generally have not been a part of most people’s educational experiences.

The respondents reported sources for environmental learning as a child/teen and as an adult revealed some anticipated results and some surprises. The data indicated, as one would expect, that children get more information from school and family and adults get less information from school and family and more information from magazines and newspapers. Predictably, schools declined as a source of environmental learning from

first position for children to sixteenth position for adults. Family moved from fourth position to eleventh for adults. Zoos maintained the second position as the most frequent sources of environmental learning. Of course, one fourth of the ELC respondents were zoo visitors, so this is likely to have skewed the results somewhat.

As a source of environmental learning, television moved from third position for children and teens to second place for adults. Because television was and continues to be such an important source of EE exposure for respondents, environmental educators should consider the opportunity that television provides for EE messaging and EE programming. Television has the capability of reaching the largest audience of all the environmental learning sources listed in the survey.

Parks and refuges were also right at the top of the list as places to learn about the environment moving from the fifth position as a childhood source to fourth as adults. Nature centers moved from eleventh position for children to sixth position for adults. Nature centers sprouted in the 1950s and 1960s, so fewer nature centers may have been available to older respondents during their childhood years. This may explain why nature centers were ranked lower as a childhood source of environmental learning, but moved up in rank as an adult source.

Websites were clearly at the bottom of the list for childhood and teen years because for most respondents, the Internet was not yet available. The World Wide Web took off in 1995 (Leiner *et al.*, 2003), so it was available to only a few respondents as children, but it quickly moved up the list as a current adult source to ninth in popularity for learning about the environment. See Table 4.2.4 A & B.

For social marketing purposes, these data are very useful. It allows environmental educators to consider the variety of venues they might choose for reaching the general public. Television has become the dominating source of environmental learning in most respondents' lives. Environmental organizations might consider how they might best utilize television to market their messages about EE or undertake actual EE programming on television. As least 20 people discussed their favorite childhood animal shows orally with me after taking the survey. Marlin Perkins with *Mutual of Omaha's Wild Kingdom*, which began in 1963 and ran for 27 years, made a huge impact on the lives of many of the respondents. Without any prompting, half a dozen people were moved to describe their most memorable episode, one in which Jim Fowler wrestled an enormous anaconda in the water while Marlin narrated the event. Environmental educators should give television stronger consideration as a tool to promote their messages either through public service spots or through formal programming.

Zoos remained in second place as a source for EE for both children and adults. This means that zoos along with television and schools for children are a tremendous opportunity for environmental educators to get EE messages to the general public. All of the sites visited in this study have made strong efforts in this area.

Question 5 asked respondents how important is the role of EE in meeting the needs of society today and in the future. Each claim in Question 5 generated a 55% or more rating of "very important." A total of 94% of ELC respondents thought that EE's role in helping to preserve living things is important. That is a tremendous vote of support for the efficacy of EE in preserving biodiversity. At an even higher level (96%), respondents agreed that EE's role in helping maintain a healthy environment for people

to live is important. Ninety-five percent agreed that EE helps to preserve the beauty of nature and scenery and helps preserve the long-term sustained use of natural resources. Ninety-two percent agreed that EE helps to prevent expensive environmental problems and 91% agreed that EE helps prepare young people and people in the work force to address complex environmental problems. Three percent or fewer respondents thought EE's role was not important for each claim in Question 5. These overwhelmingly high percentages of support for EE's ability to meet the needs of society mean that this group of ELC visitors believes that EE can make a positive difference.

Question 6 of my survey contained seven positive and six negative claims about EE. While respondents agreed with all seven positive claims, four positive claims garnered an approval rating of 80% or more:

- 6(a) at 84%, "EE is the best investment because it costs less to prevent environmental problems than clean them up,"
- 6(c) at 91%, "EE shows learners that they should play a positive role in environmental care,"
- 6(h) at 89%, "EE can help people make the connection between a healthy environment and human health," and
- 6(m) at 80%, "National, state and local governments should support and fund EE programs."

However, three positive claims about EE generated higher levels of uncertainty and lower levels of agreement:

- 6(f) at 65% agreed with "EE should be a central goal in public school education, (19% uncertain);

- 6(i) at 56% agreed with “EE is essential for preparing learners for jobs later in life,” (29% uncertain) and
- 6(k) at 73% agreed with “EE challenges learners to understand different perspectives on complex issues” (24% uncertain).

Twenty-four percent of the respondents said they were uncertain as to whether EE would challenge learners to understand different perspectives on complex issues. Since 25% of the ELC respondents indicated they were not aware of the field of environmental education, the same 25% might not have been familiar with EE’s teaching of critical thinking skills in order to solve complex problems. There was a significant negative correlation between Question 6(k) and awareness for EE, but it was very weak. The messages “EE challenges learners to understand different perspectives on complex issues” along with messages concerning EE’s correlation with improved academic performance, improvements in classroom management, and increases in student and teacher engagement are important facts about EE that need to be better marketed to the general public. If there were a better understanding by the general public of EE teaching methodologies and results, support for claim 6(f) and 6(k) might increase.

Of the six claims in Question 6 that were negative about EE, three received strong opposition:

- 6(d), 81% of respondents disagreed with the statement, “EE has no place in public school education,”
- 6(e), 70 % of respondents disagreed with the statement, “EE needs to stay away from controversial issues,” and

- 6(l), 80% of respondents disagreed with the statement, “EE is not urgently needed now.”

Thus, it can be concluded that high percentages of ELC visitors believe in the value of EE in public school education, that there is a need for EE, and that it should **not** avoid controversial issues.

The remaining three claims about EE generated the highest levels of uncertainty:

- 6(b), 24% were uncertain about “EE teaches students to view humans as destructive to the earth,”
- 6(g), 22% were uncertain about “EE makes learners unduly worried about environmental problems,” and
- 6(j), 37% were uncertain about “EE preaches environmental activism.”

As described in Chapters One and Three, these claims are ones that have been put forth by a handful of critics of environmental education.

While humans clearly are destructive to the earth in some ways, this is generally not the way that EE is presented by environmental educators. EE’s intention is not to make people feel bad. It intends to give them an understanding of how humans can live sustainably in their ecosystem while learning how to solve environmental problems. Since 50% of ELC respondents agreed with claim 6(b), 25% disagreed with it, and 24% said they were not sure, this should be an area for clarification by those marketing EE. EE does admit to human destructiveness in some contexts, but the overall intent is to teach about minimizing destructiveness now and in the future.

Question 6(j), “EE preaches environmental activism,” received 40% agreement, 23% disagreement and 37% not sure. Part of the uncertainty for question 6(j) may have

resulted from the way the question was worded, with two emphases: “preaches” and “activism.” This clearly confused a sizeable percentage of respondents. The word “preaches” was used intentionally to give the question a negative connotation. Some EE programs do teach avenues of civic participation as a part of finding solutions for environmental problems, but the intention is not to “preach.” Again, here is another important area for clarification through EE messaging, the need for portraying EE as teaching active, positive and constructive forms of civic participation.

Finally Question 6(g), “EE makes learners unduly worried about environmental problems,” garnered 20% agreement, 59% disagreement and 22% not sure. It points to a need for EE to be marketed in such a way as to teach the general public that EE does not induce undue fear among its students. Rather, EE can teach confidence and optimism by teaching the critical thinking skills that are necessary for solving complex problems, and can provide students with opportunities to participate in projects in which they can learn what a positive difference they can make in environmental protection.

More respondents expressed a higher level of concern for the state of the environment in the world and the U.S. than they did for the state of the environment in Washington State or their local community, although levels of concern were very high across the board. Eighty-eight percent were concerned about the state of the environment in the world, 89% about the U.S., 81% for Washington State, and 81% for the local community. Interestingly 13% showed uncertainty about level of concern for Washington State and another 13% for the local community. This was higher than the 8% level of uncertainty about the world and 7% level of uncertainty about the U.S. The differences in levels of concern may have something to do with more national-level mass

media attention to alarming environmental problems that are farther from home, and comparatively less regional media attention to regional or local environmental problems.

Question 8 asked how important the role of EE is in meeting the needs of children/young people today. It tested six claims, five of which received very strong support (over 80%) and one of which received a great deal of uncertainty. Claim 8(a) at 44% approval, “EE helps students perform better in school,” generated 38% uncertainty and 18% disapproval. Since there are some emerging data that EE is correlated with better student performance (Lieberman and Hoody, 1998; Kearney, 1999; McCrae and deBettencourt, 2000; Angell, 2002; and Hart, 2003; Bartosh, 2003), this is an area where the social marketing of EE would help position EE as a very positive influence on student academic success. Considering once again that 25% of ELC respondents were unaware of the term “environmental education”, even more will probably not have heard about the successes that teachers have had incorporating EE in the classroom.

Increases in academic performance and student motivation, and reduction in classroom management problems are three key issues for parents. My own personal experience confirms this. As a parent of two nearly grown sons, a past PTA president, and from my experience as an elementary and middle school teacher, I have observed that much of the criticism directed by parents toward the public schools is that children are not engaged in their learning. This becomes more of a problem towards the end of middle school and is a huge problem for many high school students. In my elementary school teaching experience, my efforts to incorporate environmental and experiential learning into my classroom realized the precise results that EE goals aspire to and that research results are beginning to confirm. My students could not get enough from

school: they were highly engaged, were able to resolve conflicts within the school community, stayed focused on learning, and were eager to find new restoration projects. If more parents and community members knew about the successes that teachers using EE methodology in their classrooms were having, they might be much more enthusiastic supporting the integration of EE into the core curriculum.

The support for claims in Question 8 was strong.

- 8(b), 83% of ELC respondents thought that “EE helps prepare young people to make informed decisions as consumers,”
- 8(f), 80% of respondents thought that “EE is important in preparing young people to make informed decisions when they become voters.”
- 8(c), 85% of respondents thought that “EE is important in helping young people feel connected to their communities through service projects,”
- 8(d), 92% of respondents thought that “EE is important in helping young people connect with nature.”
- 8(e), 82% of respondents thought that “EE is important in helping young people learn to take care of themselves outdoors.”

Connecting children to nature and to their communities are important values that were shared by the ELC visitors and are messages that should be aired by environmental educators. Also when children learn to care for themselves outdoors, they become more attuned to nature and its subtleties. Increasing their level of awareness of nature and learning how to be comfortable in the outdoors are important first steps in fostering future stewards of the environment.

Eighty-three percent of ELC respondents were not familiar with the state mandate for EE. Even though other surveys reveal that teachers are aware of this mandate, the general public is not. This is an important opportunity for the Office of the Superintendent of Public Instruction and EE organizations to inform all Washingtonians that there is a mandate for the integration of EE in the K-12 curriculum. OSPI and other EE organizations have an opportunity to underscore this mandate with website links to EE resources, training classes for teachers, information for parents, and links to venues where K-12 educators and environmental educators can meet with parents and the public.

Comparisons of the Environmental Learning Center Respondent Group with the Centralia Post Office Respondent Group and the Environmental Association of Washington Conference Respondent Group

When compared, some results from the Centralia Post Office (CPO) respondents and the Environmental Education Association of Washington (EEAW) Conference attendees with the Environmental Learning Center (ELC) visitors were unexpected. While we speculated that the Centralia Post Office group might score considerably lower in their support of EE than the ELC group did, we never imagined that they would score the same on almost every question; their support was consistently high. The professional EE group did respond as we predicted they would. They showed significantly stronger support for EE than the ELC or the CPO group. As a group EEAW had more years of education, were more often female, and were more likely to consider themselves liberal. They also tended to have fewer children and grandchildren. However, attendance at a

statewide, overnight conference might have precluded some EEAW members who are parents from attending.

Not only were 98% of the EEAW group aware of environmental education, these professional environmental educators indicated that they could explain EE to a friend. The group mean score was 6.18 from a range of 1-7 with '7' being "could explain very well" and a standard deviation of 1.17 versus the ELC mean of 3.65 ± 1.57 and the Centralia Post Office 3.86 ± 1.66 . It was interesting to see that the CPO group believed they could explain what EE is a little better than the ELC group believed it could. There were virtually no differences in the responses between the three groups over the four parts to Question 3, which asked, "As a child or a teenager were you ever educated by anyone in school or out of school about the natural environment, environmental problems, preventing environmental problems, and ways to clean up environmental problems?"

There were no significant differences between the three groups in regards to Question 5. Respondents agreed equally that the role of EE is very important in helping to maintain a healthy environment for people to live, preserve living things, preserve the beauty of nature and scenery, promote the long-term sustained use of natural resources, and prevent expensive environmental problems. The EEAW group showed significantly higher support for the final claim than the ELC and CPO groups did. This claim stated, "EE helps prepare young people and people in the workforce to address environmental problems."

Throughout the claims listed in Question 6, EEAW attendees showed significantly more support for EE. They also showed much less uncertainty regarding

this set of questions. The Centralia Post Office group was quite a surprise throughout the claims in Question 6 because this group often showed slightly stronger support of EE than the ELC group did. However, it must be noted that the differences were too small to be significant.

Heath Packard noted that a number of respondents at the EEAW conference voiced support to him for Question 6(b), “EE teaches students to view humans as destructive to the earth.” This could explain why responses to this claim were widely distributed over the seven possible responses. Our intention was to include this claim as a pejorative critique of EE, but because it was out of context many EEAW respondents misconstrued this claim as a positive. This points to a possible weakness in the wording of the question since EEAW respondents for most questions were consistently in agreement in their responses.

The pattern found in the previous questions continued throughout Question 7 regarding the differences in levels of concern for the state of the environment. Very high percentages of EEAW respondents (80% or greater) indicated that they are concerned about the state of the environment. EEAW respondents displayed higher levels of concern while ELC and CPO groups showed virtually identical levels of concern, with some degree of uncertainty. This high level of concern from all three respondent groups about the state of the environment is an important message that the general public along with state and local legislators might be very interested in knowing about. This much support should bear some serious consideration when state and local officials formulate their election campaign, their policies and budgets, possibly giving environmental concerns a higher priority.

In Question 8, there were once again very high levels of agreement with what EE has to offer, in this case to young people, the only exception being the claim that EE “Helps students perform better in school.” Differences between the three groups continued; however, they were slightly more exaggerated than on previous questions. The ELC and CPO group showed moderate levels of uncertainty as to how important EE is in helping students perform better in school; on the other hand, the EEAW group was very clear in their strong support for this claim. This is not surprising, since the EE professional community has been aware of this argument for several years.

Question 8(e), “How important is EE in helping young people take care of themselves outdoors,” was probably new to some even to the EEAW group. This is one of the few claims where the EEAW group did not demonstrate the same pattern of response found in most of their other responses to questions. This claim also received a slightly higher level of uncertainty by the EEAW group in what had been a consistent pattern. There were no significant differences between the responses of the three groups for this question as they all demonstrated widespread support for the claim. The rest of the claims showed slightly larger significant differences between the responses of the EEAW with the ELC and the CPO groups:

- 8(b), “How important is EE in preparing young people to be informed consumers,”
- 8(c), “How important is EE in preparing young people to feel connected to their community through service projects,”
- 8(d), “How important is EE in connecting young people with nature,” and

- 8(f), “How important is EE in helping prepare young people to make informed decisions as voters?”

Both formal and non-formal environmental educators should take the time to carefully discuss and promote information regarding all the claims in Question 8, especially reinforcing the role EE can play in enhancing academic achievement.

Twelve Hypotheses

Hypothesis 1

No differences were found between where respondents lived and their awareness of the term environmental education. Respondents from urban, suburban, rural areas and small towns had equivalent levels of exposure to EE. No matter where ELC visitors lived, 74% of them were aware of EE and 26% were not. Clearly environmental educators should do more to reach the last 26% of the public who are not aware of EE.

Hypothesis 2

There was a significant positive correlation between childhood and adult EE exposure frequencies and levels of concern for the state of the world, the U.S., Washington State and local communities. This correlation points to the general need to continue to provide multiple opportunities for environmental learning in many kinds of venues.

Hypothesis 3

There was a significant positive correlation between levels of education and support for the statement, “EE is the best investment because it costs less to prevent environmental problems than to clean them up.” Respondents with just a high school

education displayed the highest level of uncertainty and slightly lower levels of agreement for this claim. Thus, more education apparently is correlated with a clearer understanding of the economics of pollution prevention or pollution clean-up. This claim reinforces the need for more EE in K-12 schools so that high school students can graduate with a better understanding of environmental issues. This claim also needs to be marketed broadly so that those who did not attend college still have access to the information regarding EE being the best investment because prevention costs less.

Hypothesis 4

People of all occupations supported the statement that “EE should be a central goal in public school education.” There were no significant differences between occupations and their degree of support for the statement. Occupations were grouped into 10 categories: stay-at-home parent, student, teacher, health worker, other white collar worker, natural resource extractor, blue collar worker, military, retired and other. It is possible that natural resource extractors may have had noticeable differences, but there were too few of them in either the ELC group or the CPO group to be significant. These results continue to underscore the widespread support that is already evident.

Hypothesis 5

There was a significant difference in the responses by conservatives, moderates, liberals and independents in their degrees of support for this claim, “National, state, and local governments should support and fund EE programs.” The differences, however, were not large and reflected a greater percentage of uncertainty by conservatives and moderates rather than disagreement with this claim. While 80% of ELC respondents agreed with the need for national, state and local funding of EE, only 6% disagreed.

Fourteen percent were uncertain about this claim. The differences in levels of support for government funding by the four political groups were small and reflected broad political support for the government funding of EE by ELC respondents. Again, these results reveal that people across political persuasions in this study generally think that all levels of government should support EE.

Hypothesis 6

Eighty percent of ECL respondents disagreed with the statement, “EE is not urgently needed now.” However, people residing in rural areas expressed significantly more uncertainty, 23%, than did people residing in urban (10%), suburban (10%), and small towns (10%). This degree of uncertainty was the difference seen between respondents from urban, suburban, and rural areas, and small towns. Because people live farther apart from one another in rural areas, environmental problems such as air and water pollution might be viewed as less pressing than for those that are living in much more congested conditions. These results matched our predictions. However, people from rural areas are not exempt from environmental problems such as agricultural run-off in streams and rivers, pesticide contamination, soil loss, and threats to salmon and other wildlife. EE can play as important a role in maintaining the health of the environment in rural areas as it can in urban and suburban ones. EE messaging can and should reinforce this.

Hypothesis 7

A positive correlation was found between respondents’ level of community involvement and support for the statement “EE helps young people feel connected in their community through community service projects.” Respondents reporting

themselves as active to very active in their community agreed most strongly with this statement. Fifty-one percent of the active to very active members supported this claim while only 34% of the inactive to somewhat active did so. Youth are in need of feeling connected to their communities across the U.S. (Levine and Cureton, 1998). Having youth participate in community projects that improve the environment not only helps create a sense of belonging, but also allows youth to do something valued by the community. Maybe a helpful follow up question would have been, “How connected do you feel in your community?” EE messaging could focus on community service not only as a way to connect youth to their communities, but perhaps as a way to connect adults as well.

Hypothesis 8

There were some significant differences found between the different age groups and levels of concern about the state of the environment in the world, the U.S., Washington State and local communities. Respondents' levels of concern were higher among older respondents. Respondents 18-34 had an average level of concern for Washington State at 76%. Respondents between the ages of 35-54 had an average level of concern about the world of 89%. Respondents 55–65 on up averaged 87% concern about the world. Perhaps as respondents gain knowledge over time and acquire a larger perspective, they become more concerned at all levels about the environment. The highest level of concern for the world, the U.S., Washington State and the community was found with the 45-54 year old group. Maybe this is because this age group includes the baby boomers whose formative high school and college years occurred around Earth Day. Overall, respondents demonstrated more concern for the world and the U.S. over

Washington State and the community. EE messaging could focus more on local and regional problems.

Hypothesis 9

Significant differences were found between male and female respondents to this question with females showing more support for “EE challenges learners to understand different perspectives on complex issues.” While there have been gender differences found in the NEETF/Roper Starch Polls with regard to degrees of environmental concern and knowledge level, there is not a good understanding as to why these differences exist. This hypothesis was merely looking to see if we could replicate some of the gender differences, but it does not illuminate the reason for the difference. There is some speculation about this in eco-feminist literature saying that women have a social role in society as caregivers, and they also have a social role as the ones in society who do cleaning of clothes, kitchens and households, and both of these social roles might foster more environmental concern (MacGregor, personal communication, 2004).

Hypothesis 10

There were no differences between the types of occupations reported by respondents and their support for the role of EE in “Helping to maintain a healthy environment for people to live.” There was very strong support for this claim across the board with responses running 96% in support, 2% not sure, and 1% opposed. Respondents of all occupations thought that EE helps maintain a healthy environment to live. Social marketing can reinforce this message.

Hypothesis 11

A positive correlation between exposure to nature centers and level of community involvement means that those reporting higher exposure to nature centers generally report being more active in their communities. The National Audubon Society will be pleased to see that a positive correlation was found here, especially since they are developing a network of “Audubon centers” across the country to educate the public about their local environments. Audubon also aims to help people become active in their communities to preserve and protect nature for future generations. This correlation also suggests the importance of involving nature center visitors and participants in service and service-learning projects, that is, in active engagement in environmental restoration and community improvement.

Hypothesis 12

There were some small but significant differences between people with differing political views and support for the statement, “EE connects children with nature.” While there was overwhelming support for this claim among ELC visitor respondents at 92%, conservatives expressed a little more uncertainty about this claim than did moderates, liberals, or independents. While statistically significant, the difference was marginal.

When political views were cross tabulated with all the claims presented in this survey, the remarkable difference found within political views was simply that conservatives tended to be less certain and liberals tended to be more strongly supportive of claims about the value and benefits of environmental education. This creates a wider gap between conservatives and liberals than would be found between conservatives with moderates and independents or between liberals with moderates and independents. It

should also be noted that when education levels of the ELC respondents were cross-tabulated with political views, conservatives in this sample had significantly lower levels of education than moderates, independents or liberals.

Conclusions

The major conclusion of this study is that support for environmental education on the part of the survey group was consistently very high. These data revealed that although visitors to the Environmental Learning Centers and the Centralia Post Office were different in terms of demographic features, their opinions regarding the claims tested on environmental education were virtually the same.

It is possible that there are some statistically moderate or even strong differences or correlations within the data that have yet to be discovered. This is a large data set and it has not been fully evaluated. The data will be made available on CD through Audubon Washington for interested parties to analyze.

The advantage to having the EEAW group as a second comparison group was that environmental educators have spent their working years considering most of the questions in the survey. Their answers reflect a great deal of thoughtful consideration and experience working in the field of environmental education.

Professionals in the field of community-based social marketing advocate personal interaction with the public to ascertain their values and viewpoints. One of the benefits of this study was the opportunity to talk informally with people after they completed the survey. While we did not track individual oral responses to the survey, we noted that approximately fifty people expressed gratitude for this project. Two or three from

separate survey locations were moved to tears because they said they were so grateful that we were doing a study on environmental education, the one thing that they felt could make a difference in saving the environment. One woman, after completing the survey in the morning, stopped by in the afternoon with a truckload of old fence boards; she was looking for a recommendation from us as to what she could do with them besides taking them to the landfill. At the Centralia Post Office at least 10 people refused the flashlights because the flashlights were made in China; they explained that they wanted to support U.S. workers. This refusal of gifts for this reason did not occur at any of the other sites. However, gifts were refused by several dozen respondents at other sites who said they did not need a gift in exchange for their opinion and time.

One blue-collar worker at the Centralia Post Office threatened me with physical violence because he wanted help with the spelling of the word “pollution.” Perhaps this points to a need for the integration of EE into language arts curriculum (among other things).

The most interesting remarks for me came from the handful of natural resource extractors at the Centralia Post Office who were not satisfied in just receiving a free gift. Three individuals who worked in the logging industry expressed that loggers felt personally attacked by environmentalists. They were upset because they felt they were viewed as “bad” people by some environmental organizations, and they were afraid that EE would identify loggers as being “bad” people as well. My response was that environmental educators hope to teach people how to engage in discussions that are mutually respectful of the opinions and occupations of others in order to solve problems shared by the community. I added that we needed to move beyond the polarization that is

occurring in our society and learn how to talk with each other because ultimately we all want the same things: a healthy sustainable environment in which to live and work, the ability to solve problems with our neighbors and within our communities, and relevant engaging educational experiences for our children and ourselves. It would be difficult to find anyone who would not want these things, but we need to learn how to see and empathize with others in order to solve any of these challenging environmental problems. Looking at issues and ideas that are agreed upon in order to create a shared vision will help in moving past roadblocks. The loggers in these conversations appeared to be satisfied with my remarks.

All of these conversations were highly illuminating and stimulated my thinking about the richness of what focus groups or personal interviews might have to offer. In addition, I realized how much people need a safe place to voice their views without facing condemnation from those with opposing viewpoints. I believe that when people move past accusations and name calling, they can discuss valid issues from the many perspectives that make up our communities. Environmental education can and will provide the skills that are sorely needed in this area.

Recommendations

- The results from this study demonstrate that a random nationwide study of attitudes towards EE is merited. Information from a random study would show EE organizations as well as the public in general what a majority of Americans are thinking in regards to EE.

- Future studies should also be done in more diverse environments such as shopping malls, low-income neighborhoods and public housing areas including areas where English is not the primary language spoken.
- If possible, future studies and surveys should be carried out with telephone or direct contact with the public. At the survey sites, our direct interactions with the public revealed that they are very interested in this subject and have rich ideas. A survey strategy that could capture this qualitative information would be very useful.
- Opinions of natural resource extractors need to be collected. There could be a gap in understanding given that Washington's economy depends strongly on natural resource extraction.
- More public education is needed regarding the merits of EE in the K-12 classroom and in colleges and universities. Many ELC and CPO respondents were unaware of the benefits of EE in the classroom, i.e. improvements in academic performance, reduction of classroom management problems, and increased motivation of students and teachers.
- The Washington State public needs to be informed regarding the mandate (WAC 180-15-115) for the full integration of EE in the K-12 classroom. OSPI, the governor, legislators, and environmental organizations can all help to get this word out.
- Messaging of EE especially at ELCs or to ELC members, donors, and funders could include information that lets the public know of the strong support by ELC visitors of the EE claims tested in this survey.

- EE Messaging should inform leaders in government and environmental organizations that 80% of the visitors to Environmental Learning Centers, the Centralia Post Office and the Environmental Educators Association of Washington support national, state, and local government funding of EE.
- Organizations interested in promoting and delivering EE messages need to take a serious look at using television as a medium for getting their messages out to the largest number of people.
- Environmental educators also should work collaboratively with zoos, aquariums, museums, nature centers, parks and refuges to develop and present consistent EE messages.

Visitors to Environmental Learning Centers, the Centralia Post Office and the Environmental Educators Association of Washington all expressed strong support for environmental education in Washington State. While the NEETF/Roper Poll (2000) found 95% and higher support for EE within a survey of environmental knowledge and attitudes, this study did not find such high support, but very high indeed, consistently in the 80 and 90% deciles. Not only did respondents in this study agree with claims about what environmental education does, but they also agreed with the need for government funding of EE programs. It is time for environmental educators to get this information to the general public.

This project generated a great deal of excitement among all the individuals involved in the creation and implementation of the survey. The best part was the analysis and evaluation of the results that turned out to be more supportive of EE than we originally imagined. The results from this survey have given me a real sense of hope that

we may have found a starting point for dialogue in our communities. If we all want to leave nature in a better state for our children, grandchildren and many generations to come, many more people will need to get involved, and they will need the knowledge, skills and motivation to do it. Through EE, people will learn that in this struggle, each and every person and perspective matters.

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Appendix A

Eugene Odum's List of 20 Concepts to Improve Eco-literacy

Concept 1. An ecosystem is a thermodynamically open, far from equilibrium, system. Input and output environments are an essential part of this concept. For example, in considering a forest tract, what is coming in and going out is as important as what is inside the tract. The same holds for a city. It is not a self-contained unit ecologically or economically; its future depends as much on the external life-support environment as on activities within city limits (Odum 1983, Patton 1972, Prigogine et al. 1972).

Concept 2. The source-sink concept: one area or population (the source) exports to another area or population (the sink). This statement is a corollary to concept 1. It is applicable at ecosystem as well as population levels. At the ecosystem level, an area of high productivity (salt marsh, for example) may feed an area of low productivity (adjacent coastal waters). At the population level, a species in one area may have a higher reproduction rate than needed to sustain the population, and surplus individuals may provide recruitment for an adjacent area of low re-production. Food chains may also involve sources and sinks (see concept 12; Lewin 1989, Pulliam 1988).

Concept 3. In hierarchical organization of ecosystems, species interactions that tend to be unstable, nonequilibrium, or even chaotic are constrained by the slower interactions that characterize large systems. Short-term interactions, such as interspecific competition--the evolutionary arms race between a parasite and its host, herbivore-plant interactions, and predator-prey activities--tend to be oscillatory or cyclic. Large, complex systems--such as oceans, the atmosphere, soils, and large forests--tend to go from randomness to order and will tend to have more steady-state characteristics, for example, the atmosphere's gaseous balances. Accordingly, large ecosystems tend to be more homeostatic than their components. This principle may be the most important of all, because it warns that what is true at one level may or may not be true at another level of organization. Also, if we are serious about sustainability, we must raise our focus in management and planning to large landscapes and beyond (Allen and Starr 1982, Kauffman 1990, O'Neill et al. 1986, Prigogine and Stengers 1984, Ulanowicz 1986).

Concept 4. The first signs of environmental stress usually occur at the population level, affecting especially sensitive species. If there is sufficient redundancy, other species may fill the functional niche occupied by the sensitive species. Even so, this early warning should not be ignored, because the backup components may not be as efficient. When the stress produces detectable ecosystem-level effects, the health and survival of the whole system is in jeopardy. This idea is a corollary of item 3: parts are less stable than wholes (Odum 1985, 1990, Schindler 1990).

Concept 5. Feedback in an ecosystem is internal and has no fixed goal. There are no thermostats, chemostats, or other set-point controls in the biosphere. Cybernetics at the ecosystem level thus differs from that at the organism level (body temperature control, for example) or that of human-made mechanical systems (temperature control of a building, for example) where the control is external with a set point. Ecosystem control, where manifested, is the result of a network of internal feedback processes as yet little understood--another corollary of concept 3 (Patten and Odum 1981). Concept 6. Natural

selection may occur at more than one level. This idea is another corollary to concept 3. Accordingly, coevolution, group selection, and traditional Darwinism are all part of the hierarchical theory of evolution. Not only is the evolution of a species affected by the evolution of interacting species, but a species that benefits its community has survival value greater than a species that does not (Axelrod 1984, 1980, Axelrod and Hamilton 1981, Gould 1982, Wilson 1976, 1980).

Concept 7. There are two kinds of natural selection, or two aspects of the struggle for existence: organism versus organism, which leads to competition, and organism versus environment, which leads to mutualism. To survive, an organism does not compete with its environment as it might with another organism, but it must adapt to or modify its environment and its community in a cooperative manner. This concept was first suggested by Peter Kropotkin soon after Darwin. (Gould 1988, Kropotkin 1902).

Concept 8. Competition may lead to diversity rather than to extinction. Although competition plays a major role in shaping the species composition of biotic communities, competition exclusion (in which one species eliminates another, as in a flour beetle microcosm) is probably the exception rather than the rule in the open systems of nature. There, species are often able to shift their functional niches to avoid the deleterious effects of competition (den Boer 1986).

Concept 9. Evolution of mutualism increases when resources become scarce. Cooperation between species for mutual benefit has special survival value when resources become tied up in the biomass, as in mature forests, or when the soil or water is nutrient poor, as in some coral reefs or rainforests (Boucher et al. 1982, Odum and Biever 1984). The recent shift from confrontation to cooperation among the world's superpower nations may be a parallel in societal evolution (Kolodziej 1991).

Concept 10. Indirect effects may be as important as direct interactions in a food web and may contribute to network mutualism. When food chains function in food web networks, organisms at each end of a trophic series (for example, plankton and bass in a pond) do not interact directly but indirectly benefit each other. Bass benefit by eating planktivorous fish supported by the plankton, whereas plankton benefit when bass reduce the population of its predators. Accordingly, there are both negative (predator-prey) and positive (mutualistic) interactions in a food web network (Patton 1991, Wilson 1986).

Concept 11. Since the beginning of life on Earth, organisms have not only adapted to physical conditions but have modified the environment in ways that have proven to be beneficial to life in general (e.g., increase O₂ and reduce CO₂). This modified Gaia hypothesis is now accepted by many scientists. Especially important is the theory that microorganisms play major roles in vital nutrient cycles (especially the nitrogen cycle) and in atmospheric and oceanic homeostasis (Cloud 1988, Lovelock 1979, 1988, Kerr 1988, Margulis and Olendzenski 1991).

Concept 12. Heterotrophs may control energy flow in food webs. For example, in warm waters, bacteria may function as a sink in that they short-circuit energy flow so that less energy reaches the ocean bottom to support demersal fisheries. In cooler waters, bacteria are less active, allowing more of the fruits of primary production to reach the bottom (Pomeroy 1974, Pomeroy and Deibel 1986, Pomeroy and Wiebe 1988). Small heterotrophs may play similar controlling roles in terrestrial ecosystems such as grasslands (Dyer et al. 1982, 1986, Seastadt and Crossley 1984). This concept is a corollary of concept 11.

Concept 13. An expanded approach to biodiversity should include genetic and landscape diversity, not just species diversity. The focus on preserving biodiversity must be at the landscape level, because the variety of species in any region depends on the size, variety, and dynamics of patches (ecosystems) and corridors (Odum 1982, Turner 1988, Wilson 1988).

Concept 14. Ecosystem development or autogenic ecological succession is a two-phase process. Early or pioneer stages tend to be stochastic as opportunistic species colonize, but later stages tend to be more self-organized (perhaps another corollary of concept 3; Odum 1989a).

Concept 15. Carrying capacity is a two-dimensional concept involving number of users and intensity of per capita use. These characteristics track in a reciprocal manner--as the intensity of per capita impact goes up, the number of individuals that can be supported by a given resource base goes down (Catton 1987). Recognition of this principle is important in estimating human carrying capacity at different quality-of-life levels and in determining how much buffer natural environment to set aside in land-use planning.

Concept 16. Input management is the only way to deal with nonpoint pollution. Reducing waste in developed countries by source reduction of the pollutants will not only reduce global-scale pollution but will spare resources needed to improve quality of life in undeveloped countries (Odum 1987, 1989b).

Concept 17. An expenditure of energy is always required to produce or maintain an energy flow or a material cycle. According to this net-energy concept, communities and systems, whether natural or human-made, as they become larger and more complex, require more of the available energy for maintenance (the so-called complexity theory). For example, when a city doubles in size, more than double the energy (and taxes) is required to maintain order (Odum and Odum 1981, Pippenger 1978).

Concept 18. There is an urgent need to bridge the gaps between human-made and natural life-support goods and services and between non-sustainable short term and sustainable long-term management. Agroecosystems, tropical forests, and cities are of special concern. H. T. Odum's "emergy" concept and Daly and Cobb's index of sustainable economic welfare are examples of recent attempts to bridge these gaps (Daly and Cobb 1989, Folke and Kaberger 1991, Holden 1990, Odum 1988).

Concept 19. Transition costs are always associated with major changes in nature and in human affairs. Society has to decide who pays, for example, the cost of new equipment, procedures, and education in changing from high-input to low-input farming or in converting from air polluting to clean power plants (Renner 1991, Spencer et al. 1986).

Concept 20. A parasite-host model for man and the biosphere is a basis for turning from exploiting the earth to taking care of it (going from dominionship to stewardship, to use a biblical metaphor). Despite, or perhaps because of, technological achievements, humans remain parasitic on the biosphere for life support. Survival of a parasite depends on reducing virulence and establishing reward feedback that benefits the host (Alexander 1981, Anderson and May 1981, 1982, Levin and Pimentel 1981, Pimentel 1968, Pimentel and Stone 1968, Washburn et al. 1991). Similar relationships hold for herbivory and predation (Dyer et al. 1986, Lewin 1989, Owen and Wiegert 1976). In terms of human affairs, this concept involves reducing wastes and destruction of resources to reduce human virulence, promote the sustainability of renewable resources, and invest more in Earth care.

Environmental Education Survey

To show our appreciation for your help, we have a gift for you upon completion of this survey.

Contact: Karin Kraft, Research Director/Evergreen MES Candidate-kraftkf@comcast.net

1. Were you aware that there is a field of study known as environmental education? a. Yes b. No

Circle the item that is closest to your opinion.

- | | | | | | | | |
|--|------------|---|-----------------|---|-----------|---|---|
| | Not at all | | Moderately well | | Very Well | | |
| 2. How well could you explain what environmental education is to a friend? | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

3. As a child or teenager, were you ever educated by anyone in school or out of school about:
- | | | | |
|--|--------|-------|-------------------|
| a) The natural environment? | 1. Yes | 2. No | 3. Can't Remember |
| b) Environmental problems such as air and water pollution? | 1. Yes | 2. No | 3. Can't Remember |
| c) Preventing environmental problems? | 1. Yes | 2. No | 3. Can't Remember |
| d) Ways to clean up environmental problems? | 1. Yes | 2. No | 3. Can't Remember |

4-A. Think about your **childhood and teen years**. Consider how frequently you engaged in **environmental learning** through each of the following sources. Circle a number below for each item listed.

Environmental Learning Sources:

4-B. Now, think about the **present**, and how frequently you engage in **environmental learning** through each of the following sources. Circle a number below for each item listed.

Not Applicable	Never	Rarely	Occasionally	Often		Not Applicable	Never	Rarely	Occasionally	Often	
/	0	1	2	3	n	nature centers	/	0	1	2	3
/	0	1	2	3	n	zoos	/	0	1	2	3
/	0	1	2	3	n	aquariums	/	0	1	2	3
/	0	1	2	3	n	museums	/	0	1	2	3
/	0	1	2	3	n	service clubs (Rotary, etc.)	/	0	1	2	3
/	0	1	2	3	n	hobbies/hobby clubs	/	0	1	2	3
/	0	1	2	3	n	religious institutions	/	0	1	2	3
/	0	1	2	3	n	family members	/	0	1	2	3
/	0	1	2	3	n	local/regional, environmental organizations. (Audubon, etc.)	/	0	1	2	3
/	0	1	2	3	n	TV programs	/	0	1	2	3
/	0	1	2	3	n	friends	/	0	1	2	3
/	0	1	2	3	n	radio	/	0	1	2	3
/	0	1	2	3	n	newspapers	/	0	1	2	3
/	0	1	2	3	n	magazines	/	0	1	2	3
/	0	1	2	3	n	academic journals	/	0	1	2	3
/	0	1	2	3	n	websites	/	0	1	2	3
/	0	1	2	3	n	community service orgs	/	0	1	2	3
/	0	1	2	3	n	science centers	/	0	1	2	3
/	0	1	2	3	n	school	/	0	1	2	3
/	0	1	2	3	n	work place	/	0	1	2	3
/	0	1	2	3	n	parks/refuges	/	0	1	2	3
/	0	1	2	3	n	other	/	0	1	2	3

Definition:

Environmental education is life-long learning that aims to increase people's knowledge and awareness about the environment, to provide people with the necessary skills and expertise to make informed environmental decisions, and to live responsibly in the world.

5. Indicate **how important** the role of environmental education is in helping to meet the following needs of society today and in the future:

<i>Circle the number that reflects your opinion.</i>	<u>Not Important</u>	<u>Not Sure</u>	<u>Very Important</u>				
a. Helps preserve living things.....	1	2	3	4	5	6	7
b. Helps maintain a healthy environment for people to live in.....	1	2	3	4	5	6	7
c. Helps preserve the beauty of nature and scenery.....	1	2	3	4	5	6	7
d. Helps promote long-term sustained use of natural resources.....	1	2	3	4	5	6	7
e. Helps prevent expensive environmental problems in the future.....	1	2	3	4	5	6	7
f. Helps prepare young people and people in the work-force to address complex environmental problems.....	1	2	3	4	5	6	7
g. Other: (describe and rate).....	1	2	3	4	5	6	7

6. Please tell us the extent to which you *agree or disagree* with these claims about environmental education (EE).

<i>Circle the number that reflects your opinion.</i>	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree		
a) EE is the best investment because it costs less to prevent environmental problems than to clean them up.....	1	2	3	4	5	6	7
b) EE teaches students to view humans as destructive to the earth.....	1	2	3	4	5	6	7
c) EE shows learners that they should play a positive role in the care of the environment.....	1	2	3	4	5	6	7
d) EE has no place in public school education.....	1	2	3	4	5	6	7
e) EE needs to stay away from controversial issues.....	1	2	3	4	5	6	7

<i>6. cont'd.</i>	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree		
<i>Circle the number that reflects your opinion.</i>							
f) EE should be a central goal in public school education.....	1	2	3	4	5	6	7
g) EE makes learners unduly worried about environmental problems.....	1	2	3	4	5	6	7
h) EE can help people make the connection between a healthy environment and human health.....	1	2	3	4	5	6	7
i) EE is essential for preparing learners for jobs later in life.....	1	2	3	4	5	6	7
j) EE preaches environmental activism.....	1	2	3	4	5	6	7
k) EE challenges learners to understand different perspectives on complex issues.....	1	2	3	4	5	6	7
l) EE is <u>not</u> urgently needed now.....	1	2	3	4	5	6	7
m) National, state and local governments should support and fund EE programs.....	1	2	3	4	5	6	7

7. How concerned are you about the state of our environment today...	Very Unconcerned	Unconcerned	Neutral	Concerned	Very Concerned		
a. in the world?.....	1	2	3	4	5	6	7
b. in the United States?.....	1	2	3	4	5	6	7
c. in Washington State?.....	1	2	3	4	5	6	7
d. in your community?.....	1	2	3	4	5	6	7

8. Indicate how important the role of environmental education is in helping to meet the following needs of children/young people today?

Circle the number that reflects your opinion.

	Not Important	Not Sure	Very Important				
a. Helps students perform better in school.....	1	2	3	4	5	6	7
b. Helps prepare young people to make informed decisions as consumers.....	1	2	3	4	5	6	7
c. Helps young people feel connected to their community through service projects.....	1	2	3	4	5	6	7
d. Helps connect young people with nature.....	1	2	3	4	5	6	7

8. *Cont'd.*

<i>Circle the number that reflects your opinion.</i>	<u>Not Important</u>			<u>Not Sure</u>			<u>Very Important</u>
e. Helps young people learn to take care of themselves in the outdoors.....	1	2	3	4	5	6	7
f. Helps prepare young people to make informed decisions when they become voters.....	1	2	3	4	5	6	7
g. Other: (Please describe and rate).....	1	2	3	4	5	6	7

9. Are you aware of the Washington State law requiring EE as a part of all basic subject matter K-12 (WAC 180-50-115) in the public schools?

- a. Yes b. No

Finally, we would like to ask you a few short background questions about yourself.

Please circle the appropriate responses.

10. I am a. Female b. Male

11. How old are you?

- a) 65 and older
- b) 55 to 64
- c) 45 to 54
- d) 35 to 44
- e) 25 to 34
- f) 18 to 24

12. Please describe your occupation:

13. Please indicate the highest level of education you have completed.

- a) High School
- b) Some College Courses
- c) 4-Year College Degree
- d) Graduate School

14. Are you parent or grandparent of a child under the age of 19?

- 1) parent
- 2) grandparent
- 3) neither

14a. Please circle the age group(s) of those children:

- a) 0-4 years c) 9-12 years
- b) 5-8 years d) 13-18 years

15. How would you describe your political views?

- a) Conservative
- b) Moderate
- c) Liberal
- d) Independent

16. Would you describe the area you live in as:

- a) Urban
- b) Suburban
- c) Small Town
- d) Rural

17. How would you rate your level of community involvement? (i.e. voting, volunteering, church involvement, neighborhood association, etc.)

Not						Very	
Active						Active	
1	2	3	4	5	6	7	

18. Do you have any other thoughts or recommendations regarding environmental education in your community, WA or beyond?

- a. Yes b. No

Please explain:

