University of Nebraska - Lincoln
DigitalCommons@University of Nebraska - Lincoln

Environmental Studies Undergraduate Student Theses

Environmental Studies Program

5-1-2011

The Diffusion of Environmental Literacy in an American Urban Community Through Children

Kelley Phillips
University of Nebraska-Lincoln

Follow this and additional works at: http://digitalcommons.unl.edu/envstudtheses

Part of the Educational Assessment, Evaluation, and Research Commons, Educational Psychology Commons, Environmental Sciences Commons, Other Education Commons, and the Urban Education Commons

Phillips, Kelley, "The Diffusion of Environmental Literacy in an American Urban Community Through Children" (2011). *Environmental Studies Undergraduate Student Theses.* Paper 50.
http://digitalcommons.unl.edu/envstudtheses/50

This Article is brought to you for free and open access by the Environmental Studies Program at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Environmental Studies Undergraduate Student Theses by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

THE DIFFUSION OF ENVIRONMENTAL LITERACY IN AN AMERICAN URBAN COMMUNITY THROUGH CHILDREN

by

Kelley Phillips

An Undergraduate Thesis
Presented to the Advisors of
The Environmental Studies Program at
The University of Nebraska-Lincoln
As the Final Requirement for
The Degree of Bachelors of Arts

Environmental Studies Major
With an Anthropology Emphasis

Lincoln, Nebraska
2011

Abstract

Environmental literacy is a contentious issue in the United States of America because citizens feel it is forced upon them and interferes with our materialistic culture. Also, many Americans have limited access to green space and little time to devote to increasing their environmental mindset. This project documents a technique to introduce environmental literacy to American citizens by working with single communities in a common subset of American culture. Based on a model used by anthropologists in third world countries, the goal was to diffuse environmental literacy into a community by only instructing the children of that community in environmental literacy. The hypothesis is, when environmental literacy is being spread internally through children, the community is more likely to accept it and the extent to which they understand the environment will increase. The community in this study was a hundred member group of the community associated with Randolph Elementary School, in Lincoln, NE. Twenty-five children of that distinct population enrolled in an after-school Nature Club; the curriculum of which covered topics of environmental literacy. Periodically, surveys were sent out to children and to the community to chart the diffusion, if any, of environmental information into the community. Results indicate that environmental literacy can be improved through the diffusion of information from the children into their community despite limitations on green space and time. This thesis later suggests that an increase in the time a community's children are exposed to environmental literacy equates to a greater increase in the entire community's environmental literacy.

Introduction

This thesis project documents how environmental literacy diffuses through a distinct population when the subject is only taught to the children of that community. The hypothesis is that the environmental literacy of the entire community will increase when instruction in environmental literacy is only among children of that community. In addition, that this process of diffusion can occur in circumstances of limited time and green space. It is important to understand this pattern of communication because environmentalism is generally a socially polarizing idea (Fairbanks 2010). Methods of promoting environmentalism without provoking this polarization, including the method proposed here, must be documented so as to find the most effective way for Americans to become more environmentally literate. This paper defines environmental literacy, analyzes its importance, discusses previous studies, and outlines this thesis project and its findings.

Definition of Environmental Literacy

The definition of environmental literacy is multi-faceted and complex. Knowledge of environmental issues, the skill to make educated choices, the effect that environmental choices have on policy, and participation in environmental issues are the four main elements of environmental literacy (McBeth and Volk 2010). Ecological knowledge, verbal commitment, environmental sensitivity, general feelings, issue identification, issue analysis, action planning, and actual commitments are also considered to be facets of environmental literacy (McBeth and Volk 2010). For this project, the term environmental literacy is used as a working knowledge of environmental issues, ability to think critically about environmental debates, general positive feelings towards the outdoors, and participation in environmentally beneficial practices. In this paper, the word "environmentalism" will be defined as: support and understanding of

contemporary environmental issues, ecological information, environmental sensitivity, and the appreciation of natural setting. Community culture or the culture of a community refers to the general ethics, values, actions, and traditions of distinct populations within the Unities States of America. This American culture can be described as "a capitalistic consumer culture…in which the popular vision of happiness consists of the quest for pleasure, material comfort, and entertainment through the acquisition and consumption of goods (Leach 1993)."

Importance of Environmental Literacy

Knowledge of environmental science is integral to each citizen's civic duty. The general public needs to have education about the natural world because it creates the individual's awareness about recycling, composting, energy saving and other ideal actions for conserving the environment. This knowledge benefits the natural world as well as the individual, as a lack of conservation practices will ultimately end in less resources for the individual's use. Currently, however, environmental concern is not a major priority for the majority of American citizens. Access to food, housing, media, appliances, and schooling are far more important (Fairbanks 2010). With a consumer-centric model of an ideal life, Americans "have conditioned the attitudes, values, and beliefs of human being, with disastrous consequences for the environment (Fairbanks 2010 p. 81)." As a result, a variety of serious environmental problems such as climate change, destruction of habitat, depletion of resources, and explosive population are surfacing. Many environmentalists would consider individual environmental awareness and conservation practices a personal duty. Even non-environmentalists generally agree that at least some knowledge of the subject is a civic duty, because an informed voting population makes for better policy (Short 2010). Policy makers have the overarching ability to take progressive environmental action by setting environmental goals and standards, subsidizing conservation

practices, rewarding voluntary agreements, budget allocating, and educational campaigns (Rabe 2010).

Current Environmental Literacy in America

In recent years there has been an increase in the promotion of environmental knowledge in the media and in schools. Unfortunately, the National Environmental Education and Training Foundation (NEETF) indicates that most of the information the public receives is incorrect (Coyle 2005). Largely biased, fragmented, and general statistics are how most people collect environmental information. This explains why 45 million Americans believe the ocean is a source of freshwater, 120 million think spray cans still have CFCs in them (CFCs were banned in 1978), 120 million think disposable diapers are the leading problem with landfills (they actually represent about 1% of the problem), and 130 million believe that hydropower is America's top energy source (it accounts for just 10% of the total) (Coyle 2005). It is vital to correctly inform the populous and improve their environmental literacy, but this is a difficult task because often the correct information is not the first information people receive and is likely to be seen as false simply because it is secondary.

The American public is often misinformed about environmental issues. About 80% of American adults prioritize their environmental actions and concerns from incorrect information. Only 12% of Americans in 2005 could pass a simple test on energy topics (Coyle 2005). As the world is faced with environmental issues that are only going to get increasingly complex, Americans are unprepared. In the opinion of NEEFT (Coyle 2005), Americans who wield influence in governing bodies as large as Congress and as small as town councils know little more than the public. Although a significant amount of environmental educators scoff at how the media affects environmental literacy, children and most adults get 83% of their environmental

knowledge from television, the internet, pop culture magazines, and newspapers (Fairbanks 2010). It is not that media intentionally spreads incorrect information about the environment, but rather that it lacks the ability to go in depth on issues, which causes misconceptions that encourage persistent myths (Coyle 2005). The public's lack of understanding of scientific content cannot be dismissed as something that people "just do not know." It is created by social, institutional, and personal factors (Jenkins 2003). Even people who are out in the environment for hours participating in activities like hunting, biking, skiing, sailing, and golfing are not immune to misinformation. Many have not taken the time to learn about their particular landscape. Their activity keeps them preoccupied and less interested in how their sport is affecting the environment (Fairbanks 2010).

McBeth and Volk's (2010) study of environmental literacy in 6th and 8th graders around the nation is often cited in campaigns to increase environmental literacy. In an environmental literacy test given by McBeth and Volk, students scored 73% on the environmental knowledge section, meaning the students were fairly knowledgeable. Despite their high knowledge, the environmental action portion of the test indicated their commitment to action concerning the environment was incredibly low. Action is a primary facet of environmental literacy. Although seemingly dated, William Stapp's assertion in 1969 is correct: as population and urbanization increase, people will become less inclined to know about or take action on environmental issues. He says that as population and urbanization increase the "intimate association and interaction with natural resources diminishes and his [the public's] awareness of his [their] dependency on them (Stapp 1969 p.2)."

Educational institutions are generally shifting towards a greater emphasis on ecology and the environment. Yet, some scholars believe that because educators themselves do not have

enough environmental knowledge, no real progress has been made (Esa 2010). Others believe that for progress to be made, environmental literacy must be brought into all disciplines of school (Koury 2005). This method would have a greater chance of improving environmental literacy of future citizens who are currently school-age, but does not address issues facing active citizens now: climate change, biodiversity loss, energy crises, etc. A more specific identification of the problem of American misinformation lies in the educators of America. Short (2010) writes that most educators have the same shallow knowledge of the environment even when more training is available because society treats education as an assembly line rather than a period of growth. Short believes that American public school educators "value activity without regard for its function (Short 2010 p.12)." Instead of showing an understanding or individual critical thought on environmental issues, students simply need to pass a test (Short 2010).

Internationally, as well as domestically, environmental educators and community leaders need an interdisciplinary training on the environment; to have the knowledge one learns from the media is not enough (Esa 2010). With the passing of the National Environmental Education Act in 1990, the government has spent over $100 million to increase knowledge of the environment. The act promotes an environmental educational system that is outdated. It lacks the funds for community level projects, teacher education, and public awareness campaigns. The act does not have the ability to influence more people than the higher learning community which already has access to environmental education resources. As governing bodies become increasingly aware of issues, particularly climate change, they need to use environmental education to encourage action in the public and give them knowledge of what opportunities exist to increase the lifespan of existing resources (Potter 2010).

Previous Studies with Solutions to the Environmental Literacy Problem

There have been multiple studies into the matter of environmental literacy. A study in Brazil compared students receiving a typical education to students whose schools included an interdisciplinary view of environmental issues. The findings showed that the latter group's environmental literacy was significantly better (Koury 2005). Another study in Mexico found that environmental education programs had to be tailored to different communities to make any difference. Teaching the same information to urban and rural communities left both parties lacking (Ruiz-Mallen et al. 2010). In the Ukraine, after school education programs were created because the government found the number of environmental leaders in the country to be dwindling. They began the extra-curricular Green Youth Project. The youth within the project showed improvement in all sectors of environmental literacy (Blinnikov 2010). The Department of Natural Resources in both Illinois and Florida began adult continuing education environmental programs. The results for Florida indicate there was a significant increase in knowledge of and participation in environmental issues (Main 2004). Illinois considered their program a success because the numbers of people enrolled in the program grew steadily by word of mouth popularity. More people were interested in a focused and detailed method to learn about the environment (Simpson 2010). Fairbanks (2010) indicates that even if sustainability classes were mandatory, "parents *and* schools should involve children in outdoor activities that expose them to the beauty and wonder of nature (2010 p.98)."

This Thesis Project on Environmental Literacy

As aforementioned, improving future policy makers' environmental literacy is a noble endeavor, but it does not attend to the problem of current policy makers' lack of environmental literacy. In developing countries, when there is an issue at hand that the general populous of a

village is resistant to accept, anthropologists teach the children of the community the new practice or information, and the children, in turn, teach their parents, who themselves teach non-relative community members (Ruiz-Mallen 2010). This thesis project aims to duplicate the anthropologists' method of introducing new information. The new issue to introduce is environmental literacy. Resistance to the new issue is in the form of prior incorrect knowledge of the environment and a culture uncomfortable with environmentalism. The technique to promote the new issue while minimizing the resistance is diffusing information through the children of a community. This strategy will allow conservation awareness and practices to be understood and accepted on the communities' own terms, instead of an outside agent forcing it upon them.

There have been previous studies that have explored how to spread environmental literacy from one community member to another in the social setting of the United States of America. One focused on community courses in Illinois (Simpson 2010); the other on training local residents about the everglades in Florida (Main 2004). Also, there have been studies that have taken place in countries less industrialized than America, Brazil (Koury 2005), Mexio (Ruiz-Mallen 2010, and the Ukraine (Blinnikov 2010), which use the diffusion of knowledge through children as a method of environmental education. This project is different because it combines the two areas of previous studies: setting the study in America *and* using children as a community education tool.

Raising the environmental literacy of both current and future policy makers is of utmost importance. If citizens do not have the correct information about environmental issues, they cannot make informed policy decisions to address them. The method of information diffusion through children to the rest of the community could prove an effective way to improve environmental literacy of a community internally and in a more efficient and accepted fashion.

This project's objective is to raise the environmental literacy of the entire community associated with the children in my study.

Materials and Methods

The project is designed is to encourage environmental literacy internally within a community. Federal and local government and non-profit campaigns to improve environmentalism are forces outside of the culture of a specific community. Often, the way the outside information is structured is not congruent with a particular community's culture either. By instructing the children about contemporary environmental issues, ecology, and environmental appreciation, the information can spread through an existing entity to the community. Children are in a constant state of learning in an academic setting; therefore new information such as environmentalism is not unusual. If community members learn of environmentalism through their children than the information can be pre-adjusted to fit a community's culture.

Previous studies of environmental literacy diffusion have taken place in regions abundant with natural landscapes, or, in one case, near an ecosystem of interest. However, most Americans live or grow up in settings that are urban or suburban that are usually not natural (Fairbanks 2010). The site of this thesis, Lincoln, Nebraska, is one of the latter. The community addressed by this thesis was suburban with green space limited to individual properties, and even then, was not remarkable aesthetically. In communities that do not have a access to defined aesthetic areas, such as the everglades or numerous expansive city parks, environmental appreciation is more difficult to foster.

In 2004, the Department of Natural Resources in Florida began the Master Naturalist Program. Its purpose was to improve the environmental literacy of adults, in a continuing education setting, in the counties of Florida that contain the rare ecosystem of the everglades. In the beginning, the primary facilitator of the program Martin Main gave out a survey to the participants to get a baseline of their environmental literacy. Then, when an adult finished the program they were given an exit survey to gauge their awareness of conservation of freshwater marshes. Not only did their knowledge of the ecosystem significantly rise, but their willingness to take action did as well—two main facets of environmental literacy (Main 2004).

Similar to Main's project, a series of surveys were administered to the participants of this thesis study. The community studied was connected to Randolph Elementary School in Lincoln, NE. Each week from October until January, a group of twenty-five students, grades three through five attended an after-school Nature Club; in which the curriculum focused on environmental literacy. An average of seventeen students, not always the same, attended each week. In total, an average student received sixteen hours of environmental literacy education. The measurement of environmental literacy was in the form of a survey that's questions were derived from the Nebraska Environmental Literacy Standards (Coyle 2005). The survey had three sections: environmental knowledge, environmental background, and environmental efficacy. The environmental knowledge section tested participants on their ecological savvy and contemporary issue awareness. The environmental background section inquired about their environmental habits—conservation, recycling, recreation, etc. The environmental efficacy section documented if, and how much, subjects enjoyed their environmental habits. Subjects took the survey twice, at the beginning and end of the study. Each set of surveys was different to

ensure the responses were genuine and not trivial knowledge. For research purposes, the community was separated into three zones (see Figure 1)

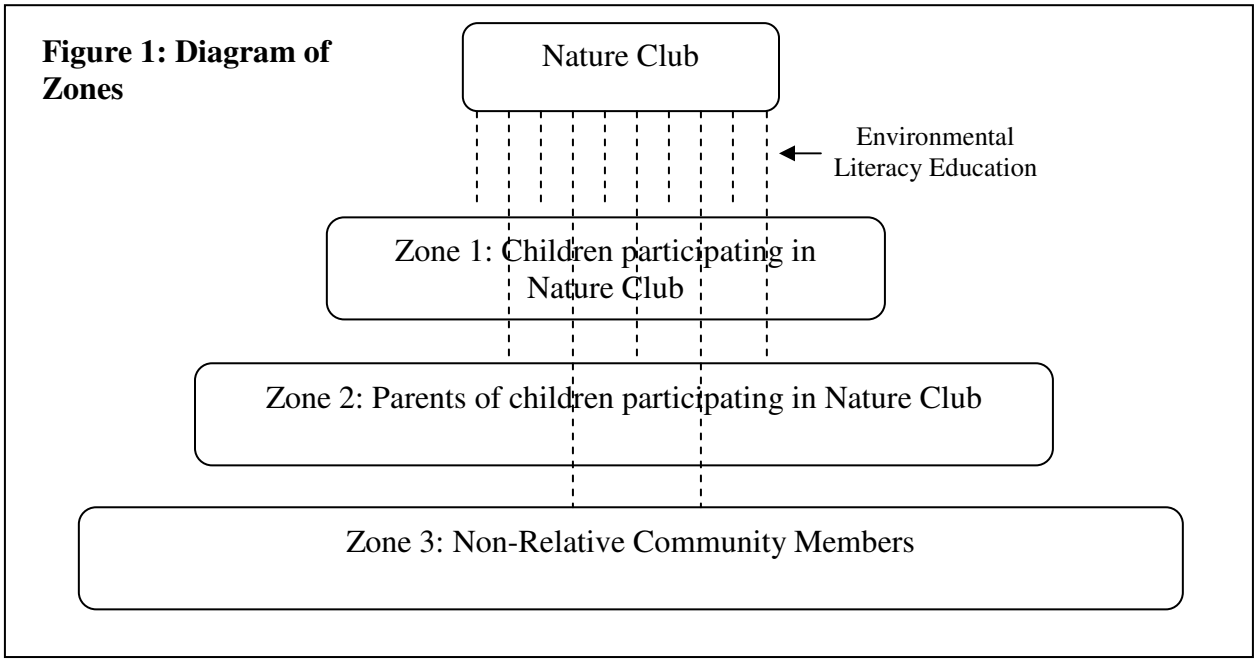


Figure 1: Diagram of Zones

The first zone was the children in the afterschool nature club who were directly affected by the environmental literacy curriculum. The second zone was those children's parents who were once-removed from the education. The third zone was non-relative community members, such as neighbors or adults whose children were not in the Nature Club who are twice-removed from the education. The total population sample was a hundred people. There were twenty-five children in zone one. It was assumed each child would have two parents/guardians; therefore zone two was estimated to be fifty people. For every two members of zone two, it was assumed that one would relay information to a peer. Zone three was estimated to be twenty-five people. The assumptions were based on informal community observation. The surveys for zone one were administered at Nature Club. Zone one delivered blank surveys to members of the second zone to fill out and return. Second zone participants were given several copies of the survey and

instructions to deliver them to third zone members. Additionally, a prize was raffled off as an incentive for second and third zone members to complete the survey.

Each survey included a disclaimer stating the survey was going to be used for research purposes only and that no personal information was required (see below). First zone members were given this disclaimer verbally as well:

> "This survey is part of an undergraduate thesis project. By completing it you are consenting for me to use all data for the research. There is no personal data recorded such as name, age, address, or contact information. If you have any questions regarding my practices please email phillipskv@gmail.com."

To analyze these data, I calculated the percent of participants who answered a question correctly in the fall survey. That percentage was then compared to the percentage of people who answered the similar question in the spring survey correctly. The raw data was used to find the sum, mean, and standard deviation of correct answers for the entire population for each section of the survey: knowledge, background, and efficacy. A statistical F-test was done to ensure the data sets of fall and spring were different enough to be compared. A statistical T-test was done to discover if the differences in raw scores were significantly changed enough to come to a definite conclusion about any differences in scores.

Results

The hypothesis of the study was as follows: environmental literacy taught to children of a particular community will diffuse into the community over time increasing the overall environmental literacy. The surveys used to measure environmental literacy were broken up into three sections: knowledge, background, and efficacy. The number of participants in each zone who were willing and able to take the survey (see Figure 2) was all lower than the initial target

population. Because of the low number of participants in Zone 2 and Zone 3, the groups were combined and called "Community." Fall surveys were the pre-test, gauging the zones' literacy before zone 1's education in environmental literacy. Spring surveys serve as the post-test, measuring the environmental literacy of the zones after zone 1's exposure.

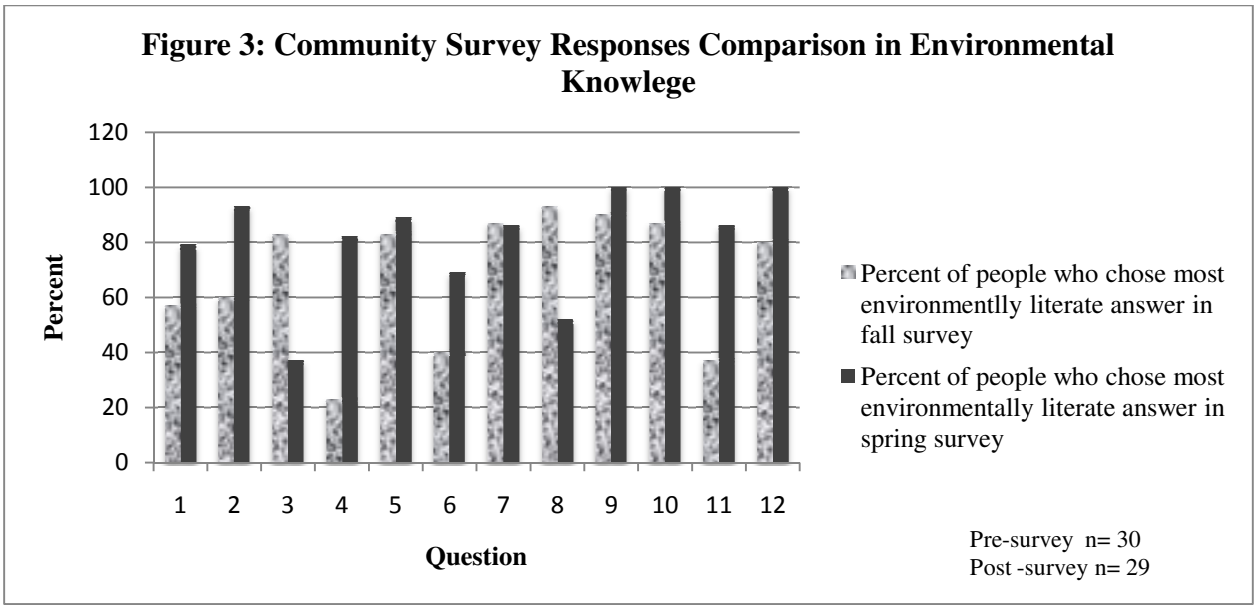
Figure 2: Number of Participants

	Zone 1: Children	Zone 2: Parents	Zone 3: Community
Initial Number of people anticipated to participate from each zone	25	50	25
Actual Number able to take the surveys	15-17	29-30 (combined with Zone 3)	29-30 (combined with Zone 2)

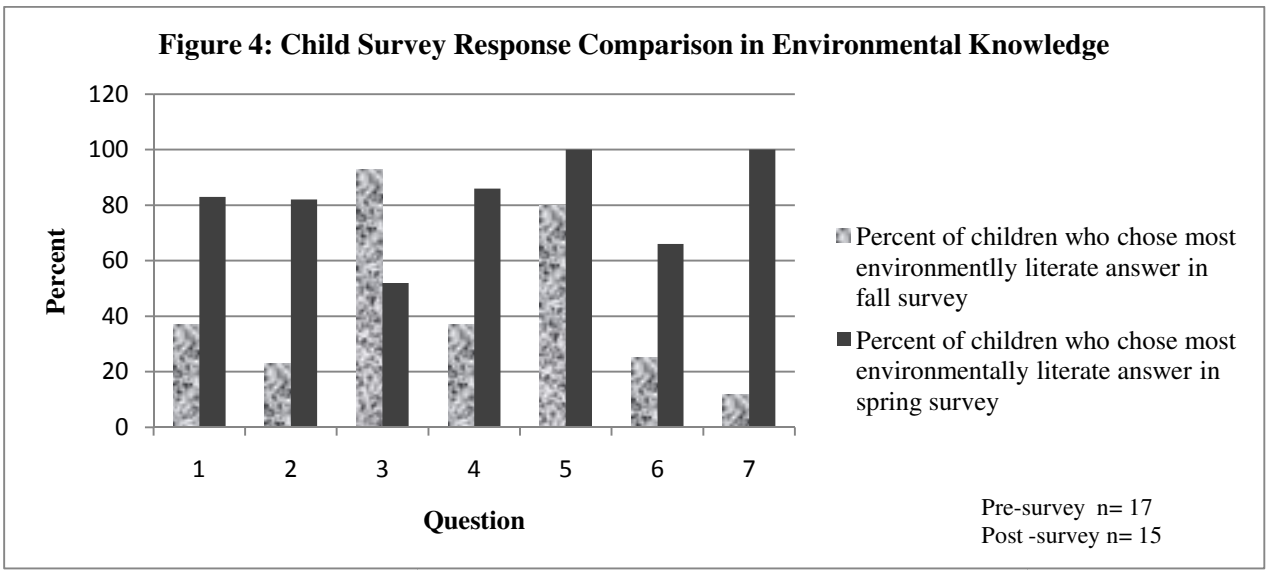
Environmental Knowledge results[1]:

The pre-survey of environmental knowledge of community members indicates that they knew significantly less about the environment than the participants in the post-survey (see Figure 3). Due to insufficient time, the topics related to questions 3, 6, and 8 were omitted from the percentage counts. In particular, questions 4, and 11 doubled in percent of correct answers. In the pre-survey, participants averaged 15% correct answers on the knowledge section of the survey. In the post-survey, participants averaged 25% correct answers on the knowledge section of the survey.

[1] Questions located in appendix 1

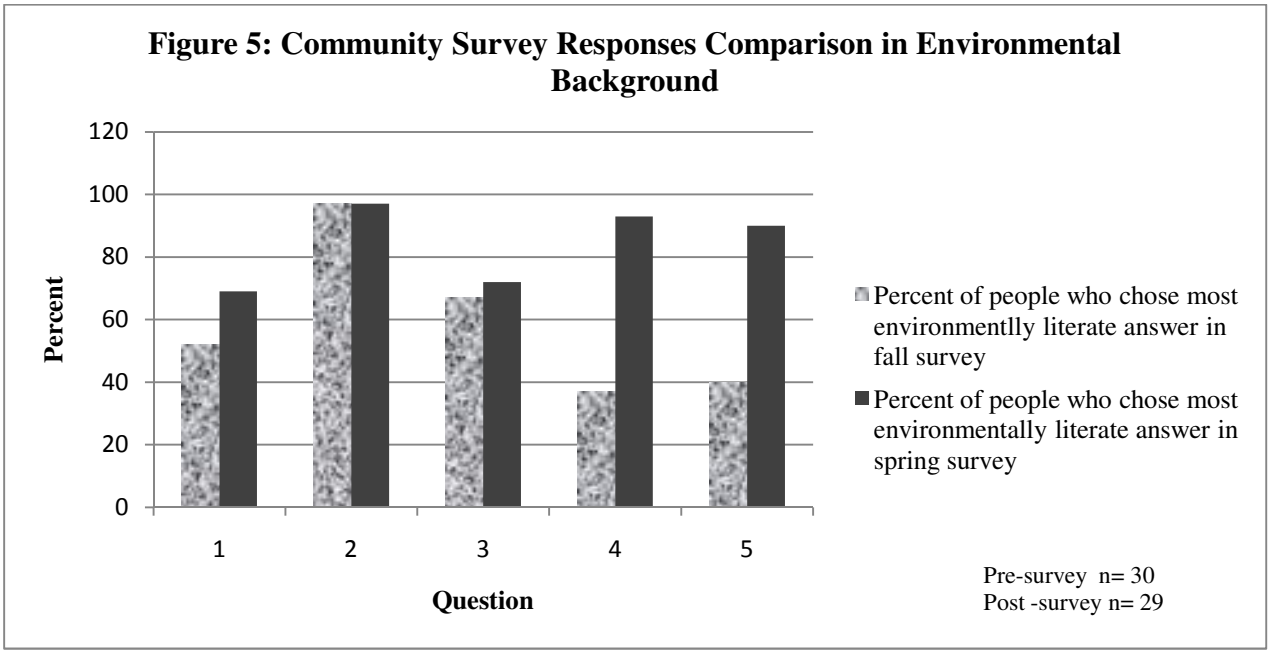


The child participants in the pre-survey knew significantly less than the child participants in the post-survey (see Figure 4). Due to insufficient project time, the topic theme for question 3 was not covered. Question 3 percentage is not included in the total for this reason. For questions 2, 4, 6, and 7 the correct responses more than doubled. Although, questions 1 and 3 had more children answer correctly in the fall. Children in the pre-survey averaged 13% correct answers while children in the post-survey averaged 35% correct answers.



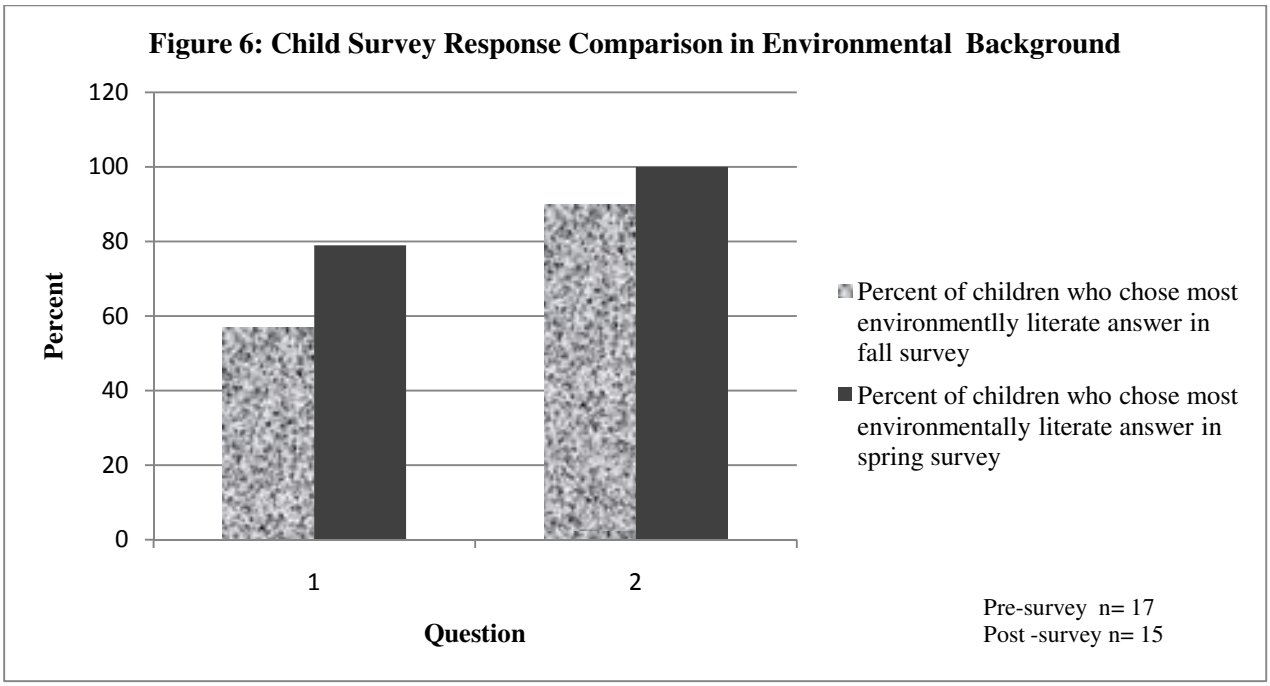
Background results[2]

Pre-survey participants within the community had less of an environmentally literate background than post-survey participants (see Figure 5). Question 2 had an equal number of fall and spring participants choose the most environmentally literate answer. Questions 4 and 5 were answered best by over double the amount in the post-survey than in the pre-survey. Pre-survey participants averaged 9% correct answers chosen. Post-survey participants averaged 14% best answers chosen.



Child participants in the pre-survey answered less questions with a correct environmentally literate answer than post-survey participants (see Figure 6). The average child in the pre-survey scored 8% in the background section, while a post-survey child scored 12% in this section.

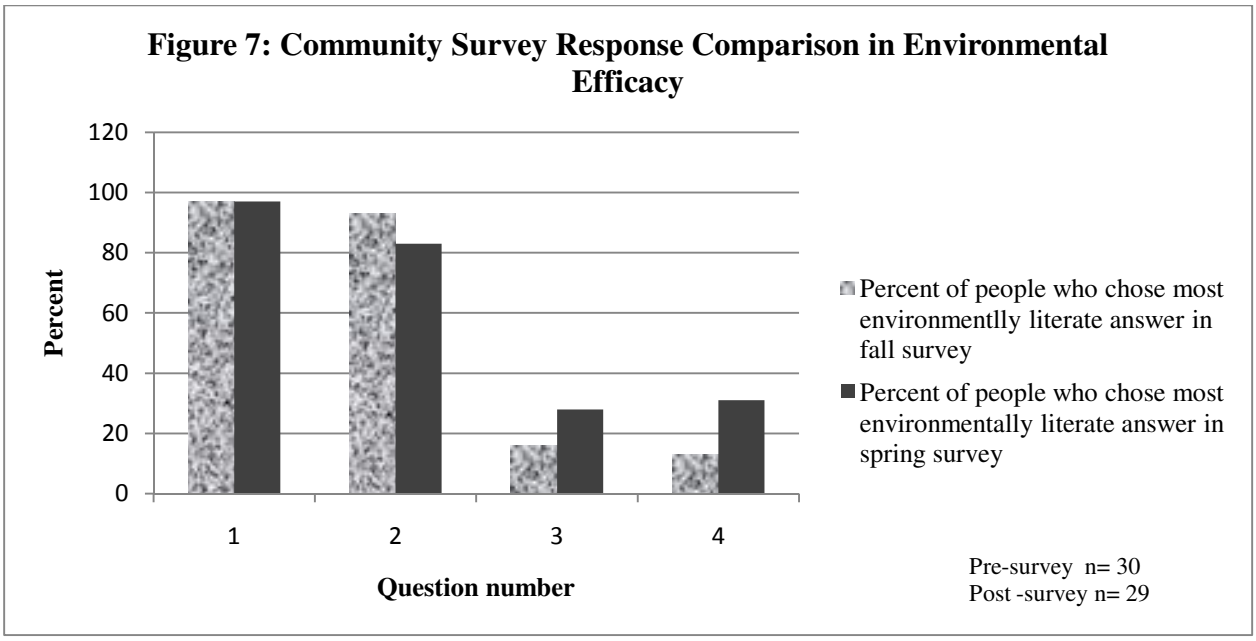
[2] Questions located in appendix 2



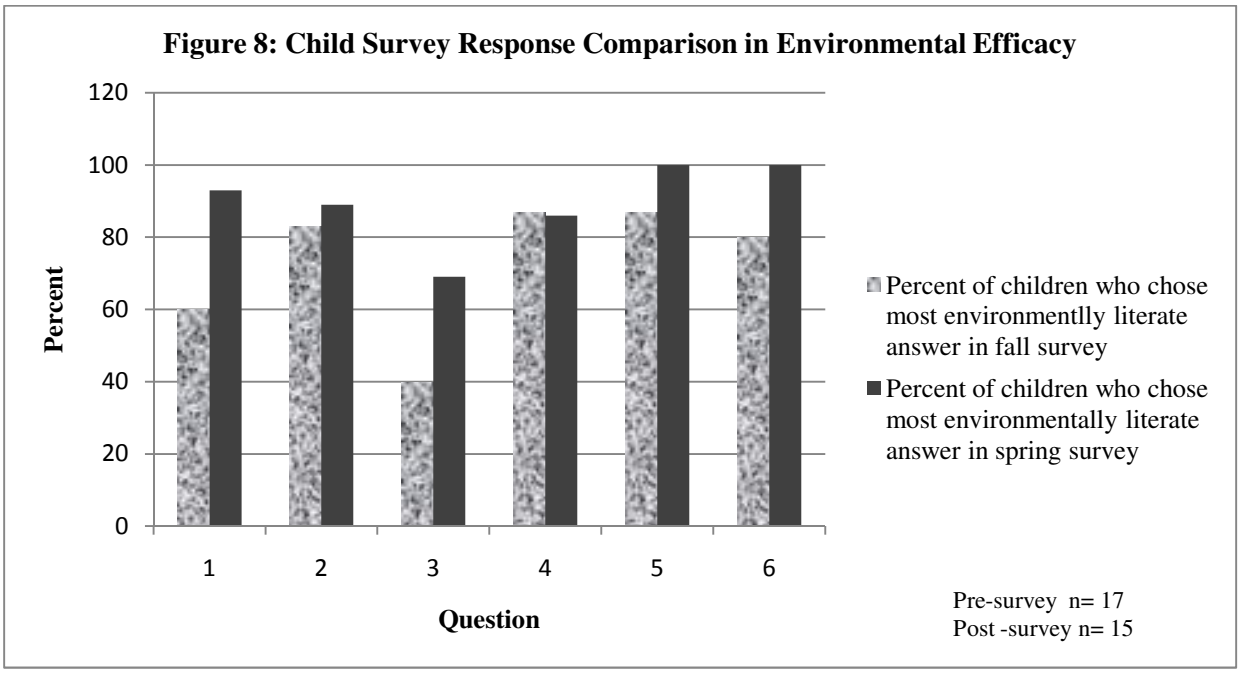
Efficacy Results[3]

Community members participating in the pre-survey answered approximately as many questions with an environmentally literate answer as members taking the post-survey (see Figure 7). Question 1 had an equal percentage answer; questions 3 and 4 had post-survey takers answer more environmentally literately than pre-survey takers. The average percentage of pre-survey participants who answered the questions with the most environmentally literate answer is 7.3%, post-survey participants averaged 8.2%.

[3] Questions can be found in appendix 3

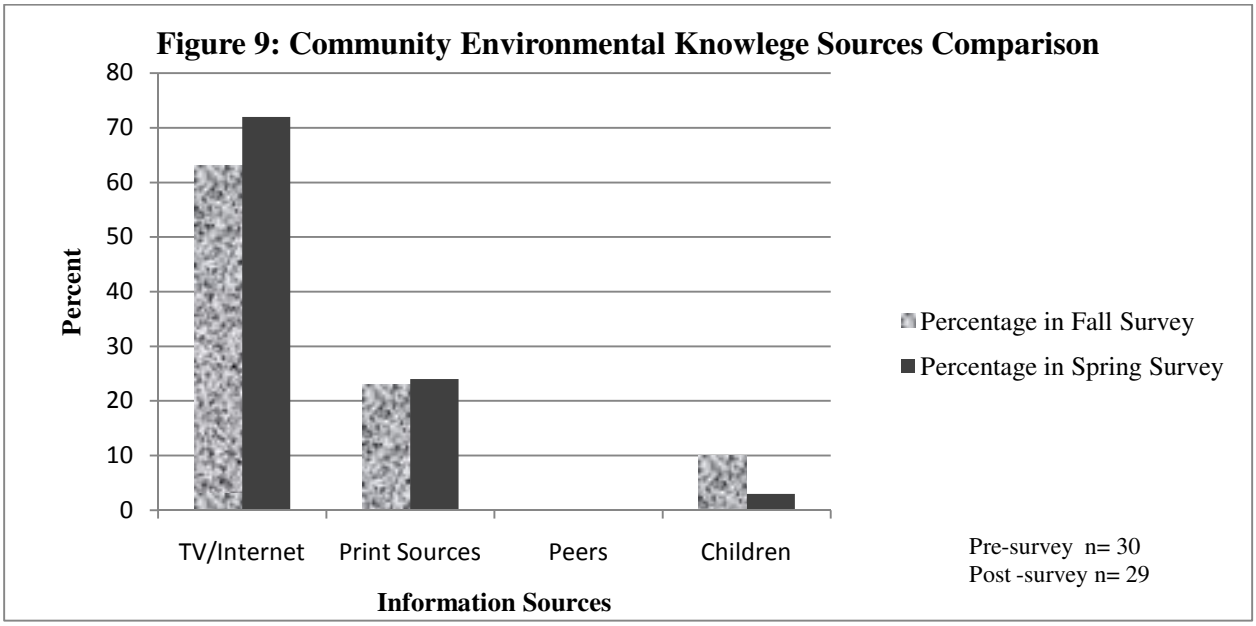


Children who took the pre-survey answered the questions with less environmentally friendly answers than post-survey children (see Figure 8). All of the efficacy questions in the post-survey were answered more environmentally friendly. The average percent of questions answered correctly by pre-survey children was 25%, post-survey children averaged 38%.



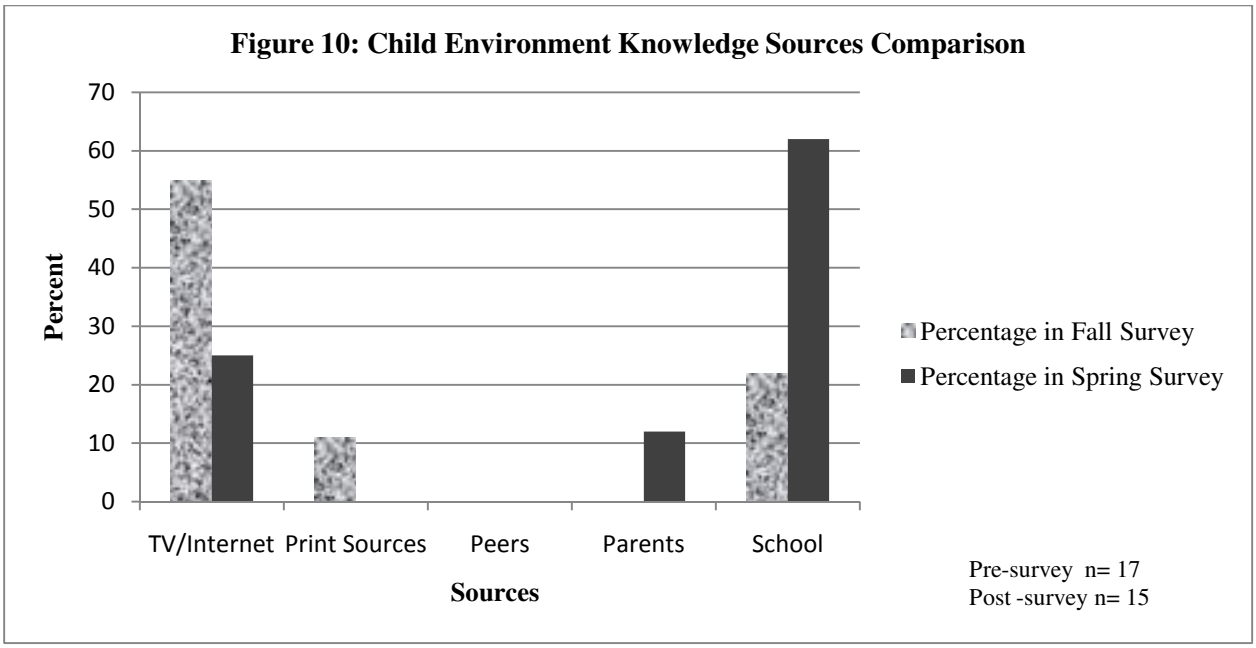
Sources of information[4]

To discover where the participants were receiving their environmental information they were asked what media they used most in the pre- and post- surveys (see Figure 9). No community members indicated they received environmental information from their peers. Overall, TV/Internet media was the most popular, followed by print sources such as newspapers, and lastly their respective children. Pre-survey participants indicated they receive more environmental knowledge from their children than post-survey community participants.



Children in the pre-survey indicated that TV/Internet was their main source of environmental knowledge while post-survey child participants indicated that school was their primary source (see Figure 10). Only pre-survey children used print sources and only post-survey children used their parents as a source of information. No child used their peers as a source of environmental knowledge.

[4] Questions are located in appendix 4



The raw number or correct answers of the pre-survey (see Figure 11) are smaller than the number of correct answers scored in the post-survey (see Figure 12). Every section of the surveys for the community and for children showed this difference. The most significant difference was in the environmental knowledge, environmental background sections for the community and the all of the sections for the children. The average scores of those categories raised more than one point. A statistical analysis (F-test) of the two data sets (see Figure 13) showed that they are different enough to be compared to one another. A T-test using all of the survey questions, including those that were later omitted because the topics were not covered in Nature Club, showed the results of not be significantly different. The T-test omitting questions whose topics were not included in Nature Club curriculum indicated that, in all but the community efficacy survey, the differences were significant.

Figure 11: Fall Survey Raw Scores

Survey Section	Sum of Score	Mean	Standard Deviation	Subject Number
Community Knowledge	219	7.30	1.76	30
Community Background	89	2.97	1.03	30
Community Efficacy	91	3.03	.809	30
Child Literacy	55	3.24	1.20	17

Figure 12: Spring Survey Raw Scores

Survey Section	Sum of Score	Mean	Standard Deviation	Subject Number
Community Knowledge	295	9.83	.834	29
Community Background	122	4.21	1.08	29
Community Efficacy	93	3.21	1.15	29
Child Literacy	87	6.21	1.25	15

Figure 13: Statistical Analysis of Fall and Spring Raw Scores

Survey Section	Alpha Level	Degrees of Freedom	F test score	T test score of all questions	T test score omitting uncovered questions	Probability, *p*
Community Knowledge	0.1	57	.0843	.0182	1.92	1.7
Community Background	0.1	57	.807	3.35	3.35	1.7
Community Efficacy	0.1	57	.0671	.503	.503	1.7
Child Literacy	0.1	30	.119	.0491	2.10	1.67

Discussion

The primary goal was to see if environmental literacy could diffuse through a community when only teaching the children. There were some potential limitations to the project. First, there was not be enough time to make a significant impact on the community. The project ran for

sixteen weeks for one hour each week. The aforementioned previous studies that saw success used at least one full school year to be able to see a significant increase in a distinct population's environmental literacy. The diffusion of information by word of mouth takes time. Secondly, by measuring levels of environmental literacy through surveys administered by the subjects themselves, it was not sure that the information was reaching the entire community. The surveys might only have measured the parents and family members of a particular child. The survey measurement also cannot account for the environmental information community members received from sources outside of the project. The community was not isolated; therefore the surveys cannot guarantee any increase in environmental literacy was due to the diffusion of information.

In general, the results for measuring the diffusion of information into the community were positive. Overall, the community participants of the spring survey answered with environmentally literate options 14% more than participants of the pre-survey. The children participants scored 38% better in the post- than in the pre- survey. The statistical analysis showed that the differences in scores were significantly different enough to show a definite change in the scores from fall to spring. Due to insufficient time in project length not all of the topics that were written into the surveys were covered in Nature Club. Significance testing including those questions showed the difference in scores insignificant, however omitting those questions indicated that the results were significantly different. Since participants taking the post-survey did not have the benefit of knowledge diffusion for those topics, the pre- and post- survey scores for those questions were, for the most part, similar. Removing them made the results of the survey relevant to the topics covered in Nature Club and therefore a more accurate measure of the diffusion of information. There are several factors that could have affected the results. The

surveys were distributed to the community indirectly through the children. There is no guarantee that the participants in the pre-survey were the same as in the post-survey. Although two completely different sets of survey participants is possible, it is improbable. It is likely that the children's parents took the survey both times, and whomever they asked to take it the first time would have been willing to take it the next time. The same number of surveys was received from the community both times the survey was administered, which supports this second explanation.

The increase in community scores could also be a result of outside environmental information, not necessarily information passed through their children. One of the questions on both surveys requested the main source of the participant's environmental information. In both surveys most information was received through television and the internet—the two sources that Coyle (2005) believes skews the public's view of the environment. Also, in the post-survey less people received information from their children than in the pre-survey, the opposite of what was expected for diffusion of information through children. Despite this, there is also very convincing evidence that information was passed on. Questions that related to topics the children learned in the program were answered more correctly by the children and the community. Tracing the children's highly improved scores on certain questions finds that those questions in the community survey were highly improved as well—more so than topics that were not covered. Curriculum in club included air pollution, biodiversity, water use and pollution, hazardous waste, recycling and enjoyment of nature. All of those topics had significant increases in both the children's and community's scores.

The overall difference in environmentally literate scores between pre- and post- surveys for the children was 38%. This percentage is more reliable than the community's percentage because the potential limitations are minimized. It is certain that all but two of the children took

both surveys. Like the community, the children were not isolated from outside environmental information sources. However, the children indicated that school was their primary source 40% more in the post-survey than in the pre-survey. This means it is most likely they received information from Nature Club more than any other source.

Anecdotal results are also positive. Based on weekly interactions, children in Nature Club repeatedly reported bringing up topics they learned in class with their family, neighbors, and peers. There was a noticeable increase in participation with outdoor activities and excitement about future lessons. Few children dropped from the program in the four months and the same number of surveys was collected each time even with the disclaimer relieving them of willful participation. Throughout the four months, two phone calls were received from parents praising the positive results their respective children had shown. One parent mentioned that her family was upset that they did not know many answers to the survey and made a resolution to be more environmentally literate.

Environmental literacy was passed through the children of the club to the community, which increased the overall environmental literacy of the community. This rise happened despite the limited green space in this urban environment. Positive improvement did happen in a limited amount of time, but more would have been better. In sixteen weeks of teaching children for one hour a week, the community's score showed a definitely positive increase. If the children were being taught about the environment in their every day curriculum, they would have at least one hundred and eighty hours of environmental literacy education. That is more than eleven times more exposure to environmental literacy than this project was able to do. The end goal of this project was to document a way for Americans to support environmentalism without appearing in

direct opposition to their culture and prior knowledge. I received no contention from participants or community members regarding the project.

Summary and Conclusions

This thesis project documented a method of spreading environmental literacy to American citizens without being met with the contention that environmentalism is frequently receiving. Employing a model anthropologists use in small communities in third world countries to a small section of the Randolph Elementary School community seemed to have an impact. The primary issues that needed to be addressed: can diffusion of environmental literacy happen within a community when only teaching children? Can environmental literacy occur in a place with limited green space? Can environmental literacy improvement happen in a relatively small amount of time? Can the diffusion of environmental literacy happen in an American community without causing contention? The results show that environmental literacy can indeed be diffused into a community with little green space in a short amount of time with little contention from members of the community.

It is recommended that there should be further research into this method. More time to educate a community's children would further aid in the increase of environmental literacy. Further research could also examine the effect sources of information have on environmental literacy. Why, for example, did two thirds of the community participants indicate in the post-survey that they received less information from their children, but scored higher? Also, the question of how one aspect of environmental literacy is related to the others should be examined. Will more environmental knowledge cause a change in behavior, or will an increase in

awareness and enjoyment of the environment create a desire for more knowledge? Documenting these relationships could lead to more efficient ways to improve literacy. If only one aspect needs to be focused on for the others to increase, it could lessen the time needed to improve the community's environmental literacy.

Works Cited

Blinnikov, Mikhail, and Jason Royce Lindsey. "Green youth of Russia, Kazakhstan and Ukraine: after-school naturalist programs in post-Soviet space." *International Research in Geographical & Environmental Education* 19 (2010): 207-25. Ebsco Host. Accessed 8 Oct. 2010.

Coyle, Kevin . *Environmental Literacy IN AMERICA What Ten Years of NEETF/Roper Research and Related Studies Say About Environmental Literacy in the U.S*. Washington, D.C.: THE NATIONAL ENVIRONMENTAL EDUCATION & TRAINING FOUNDATION, 2005. Neefusa.org. Accessed 20 Oct. 2010 <http://www.neefusa.org/pdf/elr2005.pdf>.

Esa, Norizan. "Environmental knowledge, attitude and practices of student teachers." *International Research in Geographical & Environmental Education* 19 (2010): 39-50. Ebsco Host. Accessed 10 Aug. 2010.

Fairbanks, Sandra Jane. "Environmental Goodness aand the Challenge of American Culture." Ethics & The Environment. 15.2 (2010): 80-101. Print.

Jenkins, Edgar W. "Environmental Education and the Public Understanding of Science." *Frontiers in Ecology and the Environment* 1 (2003): 437-43. JSTOR. Accessed 28 Sep. 2010.

Koury, Debora Maria Marquez. "A Critical View of the History and Perspectives in the Field of Environmental Education: Study Focusing on the Brazilian Situation." *International Research in Geographical & Environmental Education* 14 (2005): 160-72. Ebsco Host. Accessed 8 Oct. 2010

Leach, William. 1993. *Land of Desire: Merchants, Power, and the Rise of a New American Culture*. New York: Vintage Books.

Main, Martian B. "Conservation Education Mobilizing Grass-Roots Conservation Education: the Florida Master Naturalist Program." *Conservation Biology* 18 (2004): 11-7.

McBeth, William, and Trudi Volk. "The National Environmental Literacy Project: A Baseline Study of Middle Grade Students in the United States." *Journal of Environmental Education* 41 (2010): 55-67. Academic Search Primer. University of Nebraska-Lincoln. Accessed 10 Sep. 2010.

Potter, Ginger. "Environmental Education for the 21st Century: Where Do We Go Now?" *THE JOURNAL OF ENVIRONMENTAL EDUCATION*41 (2010): 22-33. Ebsco Host. Accessed 22 Oct. 2010.

Short, Philip C. "Responsible Environmental Action: Its Role and Status In Environmental Education and Environmental Quality." *Journal of Environmental Education* 41 (2010): 7-21. Academic Search Primer. University of Nebraska-Lincoln. Accessed 10 Sep. 2010.

Simpson, Thomas B. "Teaching Ecological Restoration to Strangers and Friends: An Adult Education Program in Northeastern Illinois." *Ecological Restoration* 28 (2010): 141-3. Ebsco Host. Accessed 12 Oct 2010.

Stapp, William B. et al. "The Concept of Environmental Education." *Journal of Environmental Education* 1 (1969): 30-1. Google Scholar. Accessed 28 Sep. 2010.

Rabe, Barry G., "Racing to the Top, the Bottom, or the Middle of the Pack?" Kraft, Michael E., and Norman J. Vig, eds.*Environmental Policy: New Directions for the Twenty-First Century*. Washington, D.C.: CQ Pres, 2010.

Ruiz-mallen, Isabel, et al. "Contextualising Learning through the Participatory Construction of an Environmental Education Programme." *International Journal of Science Education* 32 (2010): 1755-70. Ebsco Host. Accessed 8 Oct. 2011