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Giving Back to the Community: Addressing the Environmental Literacy Gap Through Socially and Environmentally Responsible Business Practices

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**Giving Back to the Community:
Addressing the Environmental
Literacy Gap Through Socially
and Environmentally
Responsible Business Practices**

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Table of Contents

1. Abstract	3
2. Introduction	4
3. The Environmental Literacy Problem	5
4. The Effects of Depleted Environmental Education on Young Students	11
5. Environmental Education: What does it mean and how did it come about?	16
6. Environmental Education: What Caused the Lack of EE?	21
7. Environmental Justice	28
8. Business and Social and Environmental Responsible Practices	34
9. Mitsubishi Corporation	38
10. OMRON Global	42
11. Hecho En Costa Rica Project	44
12. Conclusion	49
13. Bibliography	52

Abstract

The following paper was inspired by my passion for environmental education and environmental justice. The problem being addressed herein is the environmental literacy gap in the United States caused by the environmental education deficit. After an extensive review of literature and research regarding the issue of environmental education in America, I propose that the environmental and social responsibility movement in business can help augment the environmental education deficit in our country. In order to fully grasp the issues at hand and to understand the full scope of environmental education, I first discuss three disciplines essential to the process of integrating a solution, and these disciplines are environmental history, environmental justice, and environmental economics or “green business” as I refer to it throughout my thesis.

Introduction

Environmental education is an area of debate that is both interesting and significant in the context of our society's well being. I find no coincidence in the fact that as environmental education has declined since the 1990's so has the health of our people and our environment.

Unfortunately, since the National Environmental Education Act of 1990, environmental education has slowly been declining due to a multitude of factors. Consequently, during the time between 1990 and the present we have also seen an increase in concern for obesity, as well as rapid increases in the severity of environmental issues such as global climate change, habitat loss, and natural resource depletion. It is my belief that the issues of public and environmental health are directly linked to environmental literacy and education. I believe that by addressing the issue of lack of environmental education, we can set the stage for a sustainable and healthy future for our people and our environment. As is demonstrated time and time again, solutions to environmental issues are multifaceted, and thus there are three disciplines that are essential to understand and consider when approaching the issue in question. Three disciplines relevant to this specific issue are environmental history, environmental justice, and environmental economics. By looking at the issue at hand through the lenses of these three disciplines, we can approach a workable solution that is

beneficial to the environment, society, and also the economy; the triple bottom line.

The Environmental Literacy Problem

“The failure to develop ecological literacy is a sin of omission and of commission. Not only are we failing to teach the basics about the earth and how it works, but we are in fact teaching a large amount of stuff that is simply wrong.”

-David Orr, Ecological Literacy: Education and the Transition to a Postmodern World

The above quote by David Orr expresses precisely the main issues of environmental education, not only is there a sheer lack of environmental education curricula, but the information regarding environmental issues that is available to the public is often just false. Whether this is accidental or purposeful misinformation, the fact of the matter remains that the general populace in the United States remains at a very low level of environmental literacy and there are significant statistics to prove it. The National Environmental Education and Training Foundation (NEETF) is responsible for generating a large portion of said evidence of environmental illiteracy, as this foundation spent ten years conducting research, carrying out studies, and administering survey all related to the environmental literacy of American citizens. The results of their extensive work are quite telling of

environmental literacy in our country. Some of the aspects of their research included conducting surveys to people all over the country of all ages, which were designed to test their knowledge about basic environmental issues, or energy issues in our country. Moreover, NEETF also asked question about where people got the majority of their information regarding environmental issues, and also conducted quizzes that were meant to determine what kinds of myths or false information our citizens take to be truths. The following charts depict some of the results of the aforementioned quizzes.

Figure 1-3: National Energy Report Card Results – 2001

Subject: Knowledge of Energy Issues and Problems, 2001 • Student: The American Public

Grade		% of Total Sample Receiving Grade	% of Men Receiving Grade	% of Women Receiving Grade
A (9-10 correct)	Pass	1	1	*
B (8 correct)	Pass	3	4	1
C (7 correct)	Pass	8	10	5
D (6 correct)	Fail	13	16	10
F (5 or fewer)	Fail	76	68	84
Overall passing grade		12	15	6

* Less than 0.5%

Source: NEETF & Roper, 2001

Chart #1

Figure 1-1: National Environmental Report Card – 1997 and 2000

Subject: Environmental Knowledge • Student: The American Public

Grade		% of Total Sample Receiving Grade	% of Men Receiving Grade	% of Women Receiving Grade
A (11 or 12 correct)	Pass	11	15	6
B (10 correct)	Pass	10	14	7
C (9 correct)	Pass	11	14	8
D (8 correct)	Pass	13	13	13
F (7 or fewer)	Pass	55	45	65
Overall passing grade		32	43	21

The report card shows the percentage of Americans correctly answering each question for the 1997 and 2000 quizzes.

Source: NEETF & Roper, 1997 and 2001

Chart #2

Figure 1-14: Major Sources of Environmental Information

Percentage of adults responding

Mode	2000	2001
Television	59%	63%
Newspapers	57%	59%
Environmental groups	39%	31%
Radio	33%	32%
Product packaging	n/a	27%
Government	27%	n/a
Internet	19%	23%
Your children	16%	11%
Large companies	13%	n/a

Sources: Roper, 2000 and 2001

Chart #3

Figure 2-1: Responses to Environmental Knowledge Questions, 1998

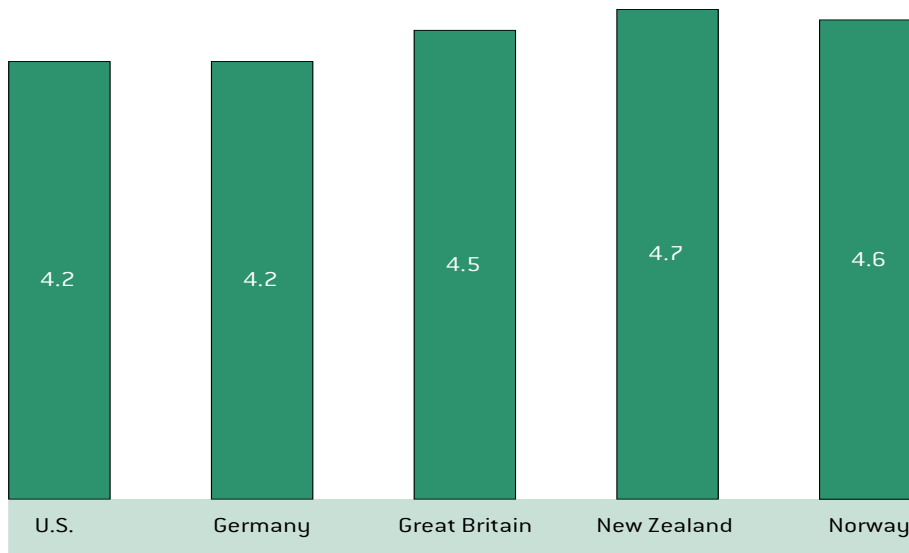
Content of Environmental Knowledge Question	Percentage Giving "Myth" Response	Percentage Answering Correctly
The goal of paper recycling programs	63	24
Leading cause of entanglement	56	10
Leading cause of childhood death worldwide	55	9
Most common source of water pollution	47	22
Primary source of oil found in rivers, lakes, and bays	40	16
How most electricity in the United States is generated	38	27
How the United States disposes of spent nuclear fuel	34	17
Only current sources of CFCs in the United States	32	33
Greatest source of landfill material	29	23
Definition of a watershed	11	41

Source: NEETF & Roper Starch Worldwide, 1998

Chart #4

Figure 1-13: International Comparison of Knowledge of Scientific and Environmental Facts

Mean number of correct answers in a seven -question quiz



Sources: Gendall, et al., 1995.

Chart #5

The first two charts in the above series shows the results of a quiz regarding basic knowledge of energy issues in the United States which reveals that the vast majority of participants (76%) failed the quiz and results of a similar quiz regarding “basic environmental facts, underlying science, causes of certain conditions, and important public environmental issues.” Much like the energy quiz, the majority (55%) of participants failed the environmental knowledge quiz. This may be telling of why energy consumption levels in the United States are so high and public support for renewable energies is relatively low and frankly apathetic. Continuing on, chart #3 demonstrates the main sources of environmental knowledge for the participants in the years 2000 and 2001, with televisions and newspapers being the main two sources in both years. Chart #4 relates to chart #3 because it shows how participants responded when given a choice between an environmental myth and an environmental truth. As you can see, for almost every question, the majority of the participants chose the environmental myth, thinking it was in fact the correct answer. This is important because as we saw in the previous chart, the majority of the information people regard as the truth is coming from newspapers and televisions, perhaps revealing something about the credibility or intentions of the mass media. Lastly, chart #5 is simply a comparison between the United States and four other developed nations, regarding a 7-question quiz about basic environmental topics. The discrepancies are quite small, but the fact remains that the United States is

on the lower end of the spectrum compared to the other countries. This reasons for this can be debated, but the overwhelming evidence suggesting that environmental literacy in the United States is low tends to suggest that we something is causing our citizens to know less than they should about important basic issues about energy and the environment.

The Effects of Depleted Environmental Education on Young Students

The factors described above not only present us with a significant gap in ecological literacy; they also create other issues for our youth. Certain methods and activities involved with environmental education have been shown to foster environmental values in schoolchildren, which then translate to positive environmental citizenship practices as shown by a 2011 study conducted with school aged children in a Turkish summer camp. The study concluded that ecology based outdoor education not only increased students' responsible behavior in regards to the environment, but also helped increase the students' "awareness of the dimensions of the environment," and caused them to develop a positive environmental ethic (Erdogan, 2011). The same study (conducted with both elementary and high school aged students) also found that with a decrease in age, there was an increase in environmental affect, showing that environmental education must start at an early age if the desired outcomes of fostering environmental awareness and positive environmental ethics are to be achieved. Thus, the absence of outdoor and

environmental education in American school systems has undoubtedly contributed to the lack of concern for the environment that thrived during the early years of the NCLB. As put by Randy White of the *White Hutchinson Leisure and Learning Group*, "extinction of experience" in environmental education not only hinders development of the learning strategies mentioned above, but also "breeds apathy towards environmental issues in our young students" (White, 2004).



Experiential learning in the outdoors has also been proven instrumental in the development of essential skills in young students such as observation, identification, awareness, reasoning, and even creativity. One such example of a practical application of experiential learning in nature is the growing field of biomimicry. Biomimicry is essentially the study of natural structures and processes in order to implement them in the

resolution of human problems, or more simply put; design inspired by nature. Biomimicry is quickly becoming a relevant concept in virtually every realm of engineering from architecture to transportation to medicine. Although biomimicry is being put to use in complex fields for complex solutions, the basic idea is simple and when students are allowed experiential learning in nature they often find themselves unknowingly using biomimetic techniques in their everyday activities such as designing paper airplanes to mimic the wing patterns of birds they observed. Such concepts help students come to the realization that the living world around us is not simply "something to learn about, but also something to learn from (Biomimicry 3.8)." Thus, environmental education can be invaluable to the development of young students as creative thinkers and problem solvers, and the lack of it could prove to be seriously detrimental to students and the future of the environment.

As mentioned previously, environmental education is an issue of societal well being meaning it addresses issues of intellect, as well as physical and emotional health. Just as environmental and outdoor education contributes to intellectual skills and development, it also has positive impacts on physical and emotional health. Contact with nature has been proven to have significant positive effects on stress, concentration, memory, mood, and even inhibition of impulses (Bratman et al., 2012), essentially making students more focused, productive, and prepared to interact with

peers in the classroom. One study in 1984 even concluded that patients recovering from surgery in rooms with views of nature recovered quicker and required less pain medication than patients recovering in rooms with a view of a brick wall (Ulrich, 1984). Even more importantly, recent studies have shown that nature can be a useful therapy technique for children diagnosed with Attention Deficit Hyperactivity Disorder (ADHD), sometimes even more effective than medicines or behavior therapy (Louv, 2005). With the number of childhood diagnoses of ADHD and other learning disorders at an all-time high (approximately 8 million per year), the increase of environmental education and outdoor experiential learning could prove to be invaluable to American students (Louv, 2005).

Finally, it is no secret that our youth are getting fatter. The past 20 to 30 years have seen a significant increase in childhood obesity, going from 7% of 6-11 year olds in 1980 to 18% 2010 (CDC). This can be attributed to what Richard Louv refers to as "nature deficit disorder," caused by immense amount of time spent indoors without any interaction with the outside world. According to the No Child Left Inside website, the average child today spends about 6 hours a day in front of a TV or computer screen, in contrast with approximately 4 minutes a day of unstructured outdoor play. Fortunately, the solution to this particular problem is relatively straightforward; more physical activity and healthier eating habits. Environmental education addresses both of these solutions as it promotes

outdoor activities via direct contact with nature, as well as providing students with an understanding of the food systems and origins of the food we eat and it is no wonder that we have seen an increase in childhood obesity and learning disorders such as ADHD during the time that environmental education has become depleted.

Clearly, the lack of environmental education is a multi-faceted issue with many different negative effects and consequently many different approaches to solving it. With so many children seeing little outdoors time when they are at home and schools carrying loads of political baggage that slow down the process of integrating environmental education into their curriculums, it seems that the push for environmental education could benefit from the aid of a third party. I believe this third party can and should be small businesses, and in the following pages I will explain why and how small businesses can give environmental education the extra push it needs to make a difference not only in environmental literacy, but I will also discuss the positive effects that small businesses can have on environmental justice and ethics. In order to do so I will use my internship at a small business in Costa Rica as a case study, to demonstrate how the solution I am proposing has been effectively put into practice.

Environmental Education: What does it mean and how did it come about?

In the United States, environmental education has existed informally since the 19th century, when publications of naturalists such as John Muir and Aldo Leopold began to be publicly disseminated by one of the United States oldest environmental organizations; the Sierra Club. The Sierra Club began producing informational publications for the public consisting of essays, poems, and literature about wilderness experiences and observations in nature providing one of the earliest sources of public environmental education and discussion. Early in the 20th century, the creation of the US National Park Service created public places (National Parks) where visitors could not only experience the wonders of nature firsthand, but also receive basic conservation and nature education from park rangers and naturalists.

The first governmental action for environmental education came in 1970 when President Nixon created the Office of Environmental Education, which was under the jurisdiction of the Department of Education and responsible for allocating grant money for development of environmental curriculum and training for teachers. This office was eliminated in the 1980's in an effort to decrease federal involvement in education, but National Environmental Education Act (NEEA) of 1990 re-established the Office of Environmental Education, this time placing it within the Environmental

Protection Agency (EPA), stating that, "current federal efforts to inform and educate the public concerning the natural and built environment and environmental problems are not adequate" and thus work to promote and fund development of curricula, projects, and other activities to increase awareness of environmental issues and "understanding of the natural and built environment." The NEEA was authorized through 1996 and during that time, "environmental education achieved national prominence in its development as a profession, but it has also proven to be a viable strategy for enhancing environmental stewardship," as stated in a report to congress regarding the effectiveness of the 1990 act. However, since the act's authorization ended in 1996, environmental education has suffered due to lack of federal attention and the passing of the No Child Left Behind Act.

More recently, a National Environmental Education Reauthorization Act was introduced into the senate in 2010 with the goal of updating and modernizing the NEEA of 1990 to further bolster environmental education, which would be another step in the right direction for environmental education and literacy in the United States.

However, within the text of this bill lies one of the inherent problems that plagues the history of environmental education in our country; defining environmental education. One of the goals of the reauthorization act is to "clarify the definition of environmental education," epitomizing the lack of consensus on what environmental education means. The history of defining

environmental education is a rough one, as scholars and educators have argued about it since the first use of the term environmental education. One of the first collaborative efforts to define environmental education in the United States came from Dr. William Stapp of the University of Michigan who, in 1969, offered this as his interpretation of the goals of environmental education:

Environmental education is aimed at producing a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, aware of how to help solve those problems, and motivated to work toward their solution.

To me, this definition clearly and concisely states the major themes that all forms of environmental education share. Knowledge of the “biophysical environment” encompasses all biological and physical aspects of our surroundings from ecosystems to manmade structures, and “associated problems” implies a relationship between the two and thus an understanding of connectedness between man and nature. Consequently, environmental education should be implemented within the context of all curricula and activities in order to emphasize this interconnectedness. As David Orr wrote in his book *Earth in Mind*, “all education is environmental education. By what is included or excluded, students are taught that they are part of or apart

from the natural world” (Orr, 1994). Essentially, any subject matter and any activity can be considered a form of environmental education if simply tweaked to include understanding of how the subject or activity in question relates to ecology and other aspects of the environment. This basic knowledge of ecological principles and how they relate to ourselves and all other concepts we explore is what is known as ecological literacy. The term ecological literacy is extremely important because of the many aspects of environmental education, it is one of the in which I will argue that small businesses can contribute to. The current EPA definition of environmental education is as follows:

Environmental education is a process that allows individuals to explore environmental issues, engage in problem solving, and take action to improve the environment. As a result, individuals develop a deeper understanding of environmental issues and have the skills to make informed and responsible decisions.

This definition of environmental education is problematic and part of the reason that formal environmental education today is not as effective as it should be in fostering environmental citizenship. The EPA definition of environmental education is too focused on issues, and thus programs and

curricula based on this definition tend to be issue based rather than experience and knowledge based.

If students learn first to appreciate the natural processes of the environment and how things work, the understanding of environmental issues will occur more swiftly, or even naturally; environmental citizenship will be learned rather than attempted to be taught. Richard Louv makes the observation that the EPA's issue based approach has resulted in children today being "aware of the global threats to the environment-but their physical contact, their intimacy with nature is fading," whereas when he was a child the opposite was true. I think that this is an important distinction to make with environmental education, because physical contact with nature fosters what E.O. Wilson referred to as biophilia, and may very well be the most important starting block for developing environmental citizenship through environmental education.

Wilson describes biophilia as an "innately emotional affiliation of human beings toward other living organisms." However, my understanding of biophilia is that whether or not it is innate in all humans, it is strengthened or weakened by one's interaction with nature during the most formative developmental years; elementary school. Therefore, young students with more direct exposure to nature during these formative years will have stronger affinities for nature than children with less exposure. Louv argues that the lack of exposure to nature that our current generation

of children have experience in their youth has in fact led to what can be termed as biophobia, or fear of the natural world. Their lack of knowledge of basic ecology and prolonged exposure to electronics and other manufactured products have caused them to despise or have unexplained fear for anything not manmade. Thus, a shift from issue based to experiential knowledge based education could prove beneficial to environmental citizenship because as the naturalist John Burrough once said, "knowledge without love will not stick, but if love comes first knowledge is sure to follow."

Environmental Education: What Caused the Lack of EE?

The first step in the process of addressing the environmental education and literacy problem is identifying the causes. The two main causes, broad as they may be, are lack of emphasis on environmental education in school curriculums and misinformation imposed on the people by societal norms.

Theoretically, after the passing of the National Environmental Education Act of 1990, environmental education should have only been increasing in terms of available programs and implementation into school curriculums. However, the No Child Left Behind Act of 2001 (NCLB) unintentionally caused many teachers and school administrators to halt any environmental education initiatives they had been pursuing. The reason being that the NCLB created national standards student must meet at the end of each grade level from K-12, and put significant pressure on teachers

to get their students to meet them. Thus, many schools began to abandon all lessons and activities that did not directly pertain to subject matter found on standardized tests and this led to a significant decrease in environmental literacy in the past few years.

Furthermore, the political nature of implementation of school curriculum also contributes to the lack of attention for environmental education in schools. Even when environmental education does make it into the conversation when implementing curriculum, it is often met with opposition due to political and religious agendas. Federal regulations require educators to “present multiple perspectives on environmental issues without advocating a particular viewpoint,” and some argue that environmental education inevitably promotes environmental protection and conservation, ideals that have certain political implications. Furthermore, religious and other interest groups that advocate creationist teachings in schools can often oppose environmental education and other natural sciences. Michael Zimmerman, author of *Science, Nonscience, and Nonsense*, argues “leaders of the modern-day creationist movement are extremely politically astute,” which give “creation science” an advantage over traditional sciences on the political stage. Obviously, creationist teachings have not found their way into mainstream school curriculums, but the strong political presence of the creationist movement and its clear opposition to natural sciences poses yet another obstacle for environmental education, which often includes

ecological concepts of evolution. Fortunately, recent years have seen a strong push for STEM educational initiatives, which aim to bolster education in the areas of science, technology, engineering and mathematics.

Environmental education falls under the STEM umbrella, but the strict NCLB standards still manage to keep environmental education out of most STEM initiatives. Another political opponent of environmental education in public school systems is the corporate world, specifically the corporations in the fossil fuel industry. These issues will be discussed in more detail in the environmental justice section, but essentially fossil fuel corporations and other large corporations often take advantage of environmental illiteracy to push their own agenda while keeping the health of our environment and our communities out of the discussion. Therefore, a more education and environmental literate community would prove detrimental to their motives, and many of these corporations take measures to hinder the advancement of things like environmental education. An example of this is the American Legislative Exchange Council (ALEC), which is often known colloquially as the “corporate bill mill” because of their strong ties to pushing legislation that favors large corporations. According to the Center for Media and Democracy- a non-profit organization dedicated to investigating media and disinformation- almost 98% of ALEC’s funding comes from corporations, many from the fossil fuel industry with Exxon Mobil being a prime example (PRwatch.org). One of ALEC’s most recent endeavors is a bill called the

Environmental Literacy Improvement Act, which according to ALEC's website is meant to "enhance and improve the environmental literacy of students and citizens" (ALEC.org). However, the language in the proposed act is worded in a way so as to undermine the true goal of environmental education, and essentially promote climate change denial. Such language includes stating that environmental education should be "presented in language appropriate for education rather than for propagandizing," making curriculum unbiased and "not be designed to change student behavior, attitudes or values," and lastly to "not include instruction in political action skills nor encourage political action activities" (ALEC.org). Furthermore, ALEC suggests in this bill that a council be formed by appointment, whose duties will include deciding what type of information would be acceptable to disseminate via environmental education. The corporate backing of this bill, coupled with the vague language suggesting an education based on skepticism of global climate change make ALEC another significant barrier to improving the quality and intentions of environmental education and literacy in the United States.

Additionally, one cannot discuss the problem of lacking environmental education without mentioning disconnect between humans and the natural environment. The two go hand in hand as one is the cause of the other and vice versa. One of the main effects that lack of environmental education has had in recent years is causing our schoolchildren today to be completely shut

off from the natural world, and one of the main reasons that environmental education has been fading is that many of the people involved in shaping education also are lacking in their knowledge of relationships between man and nature. This has to do with many factors, but I attribute the recent rapid loss of connectivity between man and nature to the exponential growth in technology in every aspect of everyday human life. Technological advancements in communications, entertainment, and agriculture all contribute to the way we perceive and treat nature. As put by Richard Louv, author of *Last Child in the Woods*, "rapidly advancing technologies are blurring the lines between humans, other animals, and machines." Louv argues that we are experiencing a new frontier populated by our youth and characterized by several trends that lend to the dismantled views of and relationships with nature. The most relevant of these trends in regards to environmental literacy are, "a severance of the public and private mind from our food's origins," and the aforementioned blurring of lines between machines, humans, and other animals.

We have entered an age of "shrink-wrapped, lab-produced foods (Louv, 2005)," and the family-farms that once supported this country have been run out of town by large food corporations that mass produce our food on factory farms. Consequently, the process of food has become almost mechanical rather than natural to the youth of our society, and in most places one must travel quite far to get a glimpse of a farm. In his essay

Raising Whole Children, Michael Ableman discusses the parallel between modern schools and modern farms saying, “they have both become factories, with assembly-line controls and engineered inputs, cranking out either grades and test scores or ‘food’.” A large part of environmental education is the understanding of nutrient cycles through ecosystems, and that includes the nutrients that we ingest, where they come from, and how they get to us. Also in the realm of changing food systems is the emergence of genetically modified organisms as many of the food products we consume today have some form of scientifically modified genes. Louv refers to the emergence of this and similar biological technologies as “the end of biological absolutes,” meaning that children today may be growing up with the knowledge of technologies that allow animals and other organisms to be developed in a laboratory, and this (along with lack of traditional outdoor environmental education) could contribute to their distorted view of natural organisms. Without a proper environmental educational base, young students could begin to view living organisms as objects that can be manipulated and even created by humans, thus leading to an environmental ethic or values system that could prove detrimental to the natural world and its expendable resources in years to come.

In addition to technological advancements in genetics and agriculture, the seemingly endless changes in entertainment technologies as well as the content that they relay to the masses have an adverse effect on perceptions

of nature. First of all, we are in an age dominated by the popular media, which has caused what is commonly known as a “culture of fear,” in which parents are afraid of the plethora of “dangers” they see daily and repetitively in the media from child abductors to insect-borne diseases and the dangers of overexposure to UV rays. This has caused many parents to significantly limit or even eliminate unsupervised outdoor play for their children, which previously provided an excellent source of wonder and experiential learning in the natural world; direct experiences with nature. These direct experiences in nature have been replaced by countless hours spent indoor playing video games, browsing the Internet, or watching TV. This preference for play with electronic stimulation rather than natural stimulation is exemplified by a San Diego 4th grader interviewed by Louv that had this to say, “I like to play indoors better ‘cause that’s where all the electrical outlets are.” However, there is a plethora of nature-based television programs that have become quite popular among adults and children alike. Thus it can be argued that children are experiencing just as much nature as children 20 years ago did, however they are experiencing it quite differently. Rather than discovering the wonders of nature on their own in their own neighborhoods and back yards, they are experiencing it through the television set, where nature becomes an exotic entity in a far away land. Once again, the interconnectedness with nature that once manifested itself as a child’s first encounter with wild edible berries is lost, this time to

GameBoys, iPods, and Television screens; indoor activities that allow children to be easily monitored and protected from the many “dangers” of the world outdoors.

Environmental Justice

The EPA defines environmental justice as, “the fair treatment and meaningful involvement of all people [...] with respect to the development, implementation and enforcement of environmental laws, regulations, and policies” (EPA.gov). However, I think a more comprehensive and relatable definition of my own creation is the “fair allocation of environmental services and burdens.” This refers to access to clean air, water, and green spaces, and involvement of all parties affected by burdens such as toxic waste facilities or highly pollutant plants or factories. As a result, environmental justice is necessarily a marriage between the civil rights and environmental movements with its interests in both protecting the health of the environment and protecting the rights of all people. Historically speaking, the demographics of those involved with the environmental conservation/preservation movement and the social justice and civil rights movement are more or less on the opposite ends of the racial spectrum, with the environmental movement primarily attracting affluent white citizens and the social justice movement gaining more attention from affected groups such as low income or ethnic minority groups. However, the unlikely

integration of the two movements in the form of environmental justice in recent years has been beneficial as described in *Killing Me Softly*, “The environmental justice movement has not only brought African Americans, Mexican Americans, Native Americans, women, and low-income white individuals into the environmental movement, it has succeeded in putting the agenda for environmental justice on the national public agenda” (Girdner & Smith, 2002). Additionally, seeing as the environmental justice movement began as a grassroots movement marked by local protests and actions often considered to be on the radical side of political action, Girnder and Smith point out that the movement has evolved in such a way that it is not only made up of local grassroots movements, but has been embraced by larger, mainstream environmental groups such as the Sierra Club and the Conservation Foundation (Girnder & Smith, 2002). However, environmental justice still has a long way to go in gaining equality, and in order to spread awareness we must first understand the journey of environmental justice and the significance of the movement.

Environmental justice is a concept rooted in the ideas of social equality, and is closely related to issues of environmental literacy and education. The environmental justice movement first made its appearance in the 1990’s in the wake of several disputes over toxic waste dumping, but in reality environmental injustices had been occurring in America since the beginning of our country’s history, been increasing and scope and severity in

the past few decades. The reason for this is mainly the growing issue of waste management. This encompasses all types of waste from solid wastes to toxic waste and even less tangible things such as air pollution. The reason that environmental justice is even a growing issue is that the entities responsible for making decisions regarding environmental burdens purposely target low income and minority communities. This is exemplified by a 1984 report entitled *Political Difficulties Facing Waste-To-Energy Conversion Plant Siting*, which was prepared by a private consulting firm that the state of California hired to help make these weighty decisions about where to place proposed plants. The report concluded, "middle and higher socioeconomic strata neighborhoods should not fall within the one-mile and five-mile radius of the proposed site," and that neighborhoods for proposed sites should be targeted based on lower levels of education and higher levels of unemployment (Figueroa, 2008). Coincidentally, neighborhoods that fit these characteristics also tend to be low-income and minority neighborhoods, and the term "low-resistance" refers to the fact that they are less likely to oppose the proposals. A report in 1983 from the U.S. General Accounting Office revealed that of all the communities in the U.S. that are homes to hazardous waste landfill facilities, 75% are poor African American or Latin American communities (Girdner & Smith, 2002). The reason for this being that lack of education translates to lack of knowledge of the potential harms and risks that factories or waste facilities pose on the health of their

environment and consequently their own health. Additionally, the high levels of unemployment that government officials and corporate leaders target translate higher levels of poverty, which often mean lack of resources available to the community for combating such social injustices.

Furthermore, high levels of unemployment allow corporations and government officials to engage in a form of "blackmail" in the unlikely event that concerned citizens speak out in opposition of the proposal. Usually, these toxic waste facilities bring an influx of jobs to the communities in which they reside, and with high levels of unemployment, these facilities could be actually be a potentially positive thing for the economic vitality of the neighborhood. Thus, community members make decisions to support such proposals without being fully informed of all consequences both negative and positive.

Therefore, it is my belief that environmental justice begins with education, but more specifically environmental education on the most basic level. This means basic knowledge of ecosystems and the services they provide humans, basics of air, water, and soil quality and how these things relate to public health, and the importance of green space for the development and health of their children, and most importantly their rights as citizens to clean, healthy environments. This type of education should begin in public schools so as to start educating the children at a young age about natural processes and relationships, so that as they grow they can

have a strong grasp on environmental issues and how they relate to their communities. This is not meant to raise environmentalists by any means as many opponents of environmental education suggest, but rather to raise children to become informed citizens able to understand all sides of political issues such as toxic waste facility siting, in the hopes that they will make decisions that are in the best interests of their communities. For example, depletion and degradation of wetlands ecosystems is a prevalent issue in many coastal communities, and is important especially in those that are subject to storms. Wetlands provide several ecosystem services; they act as buffer zones for heavy precipitation events, soaking up and great amounts of storm water, and they also act as a natural water filtration system, extracting and using toxins that may be harmful to humans. Loss of wetlands ecosystems to urban development and other activities leads to increase in amount and intensity of runoff from storm water, which often leads to higher levels of water pollution in the form of combines sewage overflows as is the case in New York City. Knowledge of the beneficial aspects of ecosystems such as wetlands allows communities to view natural settings as more than just an place where animals live, but rather an integrated part of our community and in fact a vitality in regards to our health and safety.

In addition to public environmental education, many environmental justice organizations have established their own environmental education

initiatives for the sole purpose of informing historically targeted communities. One exemplary local organization that is committed to environmental protection and justice is the Bronx River Alliance and Sustainable South Bronx, which are both non-profit organizations that are dedicated to improving one of the most highly targeted neighborhoods in the state of New York. The Bronx is the least affluent of all New York City boroughs, and unsurprisingly carries a heavy load when it comes to playing host to waste facilities. According to an article entitled *Race and Waste: Options for Equity Planning in New York City* by Professor Juliana Maantay from Lehman College, the Bronx manages over one third of all of New York City's waste. Consequently, it comes as no surprise that the South Bronx also is home to some of the highest asthma rates in the country, and an article in the New York Times stated that rates for hospitalization from asthma in the Bronx are up to five times higher than the national average, and that an estimated 20% of children in the Bronx are diagnosed with asthma (Gay Stolberg, 1999). This is almost inevitably the result of very poor air quality as a consequence of the high number and frequency of diesel trucks traveling to and from the countless waste facilities in the South Bronx.

It is plain to see that environmental justice is an extremely important issue to address, and that many large corporations are responsible for harming the health of communities with their highly pollutant facilities and

lack of accountability for negative externalities such as environmental degradation and public health. For this reason, the social and environmental responsibility movement that has been growing in recent years is so important. This movement will be discussed in the next section, but the basic concept is that companies pursuing social and environmental responsibility have the opportunity to make a real difference by changing their business practices in ways that benefit communities, environments, and their own agendas as well. Moreover, the environmental literacy movement, though its main goals are to promote environmental education and literacy, can also effectively contribute to the cause of environmental justice by creating a more informed and responsible populace with an understanding of mutualistic relationships between humans and their environments. The basic idea is that as environmental literacy and education improve, so will environmental justices.

Business and Social and Environmental Responsible Practices

In recent years with growing concerns for the environment and social equity, many businesses are beginning to look for ways to account for their negative externalities. This includes adverse effects that business practices may have on the environment and society, and the movement towards accounting for these externalities is often referred to as Corporate Social Responsibility (CSR) or Corporate Sustainability and Responsibility. There

are many ways to describe what it means to practice CSR or to run a “sustainable” business, but the common theme is addressing how business practices effect the economy, the environment, and society and figuring out ways to not only diminish negative effects on these three areas, but also ways to generate positive impacts. According to *The Age of Responsibility* by Wayne Visser, the responsible business movement’s main ideal is that “a business can remake itself so as to create an overwhelming net benefit for society and the environment in addition to its own bottom line.” Visser asserts that CSR urges businesses to start from within in order to “build rather than erode or destroy economic, social, human and natural capital.” In terms of CSR and the environment, corporations and small business alike began a shift towards sustainable and responsible practices mainly as a marketing ploy to attract attention from consumers that were becoming more concerned with environmental issues. However, as more and more businesses began to take bigger risks in their CSR initiatives like shifting to sustainably harvested materials and investing in alternative energy sources, they began to notice that many of these practices in line with CSR were in fact helping them save money in the long run on costs such as electricity bills and shipping costs among others. An anecdote from Visser’s book describes the decision of Wal-Mart executives to take a risk in hiring a consulting firm to analyze their environmental impact in order to make some changes in the direction of CSR. The consultation found that significantly

downsizing packaging on a line of toys, Wal-Mart could save 3,800 trees, one million barrels of oil, and \$2.4 million a year in shipping costs. Wal-mart (a corporation not known for its social and environmental responsibility) went through with the major change and consequently “discovered the win-win world of eco-efficiency” (Visser, 2011).

The story of Wal-Mart and its shift towards sustainability and responsibility also demonstrates another important characteristic of corporations and that is their power and influence. As part of Wal-Mart’s continuation of environmentally sustainable changes, the corporation was making a shift from traditional light bulbs to newer energy efficient light bulbs, which was to have a large impact on their biggest supplier of light bulbs and fellow corporation General Electric. According to Visser, GE opposed the idea because of their large investments in plants that produced traditional light bulbs. However, when the Wal-Mart representative reportedly said, “We are going there. You decide if you are coming with us,” GE decided it was time for them to make a change as well. The moral of this story is that corporations have lots of power not only in influencing the practices of their fellow corporations, but also of consumers. This power As businesses begin to transform the way they do things, consumers take notice and just as people are willing to pay extra for organic produce, they may also be willing to pay extra for products manufactured from sustainably harvested materials or known to be more energy efficient. This brings us to

another characteristic of CSR and that is transparency. Transparency simply refers to business making certain (or all) aspects of their business available to the public. Transparency benefits both consumers and a business because it allows consumers to find out information about businesses that they may need to make informed decisions (such as details of their CSR initiatives), and also makes businesses appear more honest and thus more favorable in the public eye. One excellent example of transparency in business is the apparel company Patagonia. On their website, consumers can find out details about each product such as how and where materials were harvested, how they were transported, and where they were manufactured. The website even provides details about all worksites (domestic and international) including any violations or hazards that each site may have experienced and how they were remedied. This type of transparency is unparalleled and truly stands out in the corporate realm.

Moreover, corporations can also contribute to the sustainability movement by entering into mutually beneficial alliances with nonprofit organizations and NGO's. Although corporations have been making contributions to nonprofits for a number of years, an article entitled *How Corporations and Environmental Groups Cooperate* argues "corporate relationships with nonprofits [...] have deepened in both content and form in recent years" (Rondinelli & London, 2007). Rondinelli and London also suggest that recent successful partnerships between corporations and

nonprofits are most abundant in the realm of environmental protection. Although motives may sometimes be driven by desire for a better public image, the results are positive as corporations not only provide monetary assistance to fund environmental protection projects, but also encourage and support their employees to participate in environmental projects. However, the aforementioned actions are characteristics of what Rondinelli and London call “arms-length” partnerships because of they require relatively low-levels of involvement. More involved partnerships are characterized by more significant actions and responsibilities taken on by the corporation such as collaborating with nonprofit organizations on environmental education and awareness programs (Rondinelli & London, 2007). These are the partnerships that are most relevant to demonstrating how the businesses have begun to contribute to addressing the environmental literacy gap that confronts our society today.

Mitsubishi Corporation

One exemplary case is the Mitsubishi International Corporation, which has supported and partnered with numerous environmental non-profit organizations through an initiative called the Mitsubishi Corporation Foundation for the Americas (Mitsubishicorp.com). This initiative is aimed at supporting projects in the areas of biodiversity conservation, sustainable development, environmental justice, and environmental education. The

foundation supports these causes through several large and small-scale actions, including Program Related Investments (PRI's), awarding grants to nonprofits (including our very own New York Botanical Garden), and corporate events. A visit to the NYBG will reveal the extent of Mitsubishi's contribution (\$300,000 over 3 years) in the form of the very well kept Mitsubishi Wetlands Trail, which is teeming with bird and plant diversity. This trail also happens to be an "outdoor classroom" for school groups that visit the adjacent Everett Children's Adventure Garden on field trips to learn about wetland ecology and plant diversity.

The foundation's most recent and significant PRI was a \$300,000 to Root Capital. Root Capital is a non-profit organization that provides small and growing businesses around the world with financial capital, management training, and other resources to help their businesses survive and promote rural prosperity. Mitsubishi International also promotes environmental awareness among all of their employees; stressing the importance of engaging in environmentally friendly practices in the workplace in order to meet their goals to reduce their environmental impact as a corporation. Furthermore, they have provided access on their website to data regarding their CO2 emissions, waste production, and electricity consumption as analyzed by a third party in order to monitor their progress on a year to year basis. An example of these figures is available below, and was extracted directly from their company website.

■ Environmental Performance

■ Electricity Consumption

(Unit: kWh)

	2010.3	2011.3	2012.3
Head offices	8,452,895	7,428,244	5,574,217
Domestic branches	1,195,575	1,152,608	1,014,287
All head offices and branches in Japan	9,648,470	8,580,852	6,588,504

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■ CO₂ Emissions

(Unit: Tons of CO₂)

	2010.3	2011.3	2012.3
Head offices	3,689	3,242	2,433
Domestic branches	522	503	443
All head offices and branches in Japan	4,211	3,745	2,876

* Converted from the above electricity consumption

* The conversion from electricity consumption to CO₂ emissions was performed using coefficients of the Greenhouse Gas Protocol (GHG Protocol) "Indirect CO₂ emissions from Purchased Electricity Version 4.0 (Sep 2010)" (WRI/WBCSD) (Country: Japan, Year: 2006, Fuel mix: All)

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Paper Consumption

(Unit: sheets)

	2010.3	2011.3	2012.3
Head offices	68,783,750	73,421,375	75,191,375
Domestic branches	7,915,724	7,141,999	6,414,291
All head offices and branches in Japan	76,699,474	80,563,374	81,605,666

* Copy paper consumption.

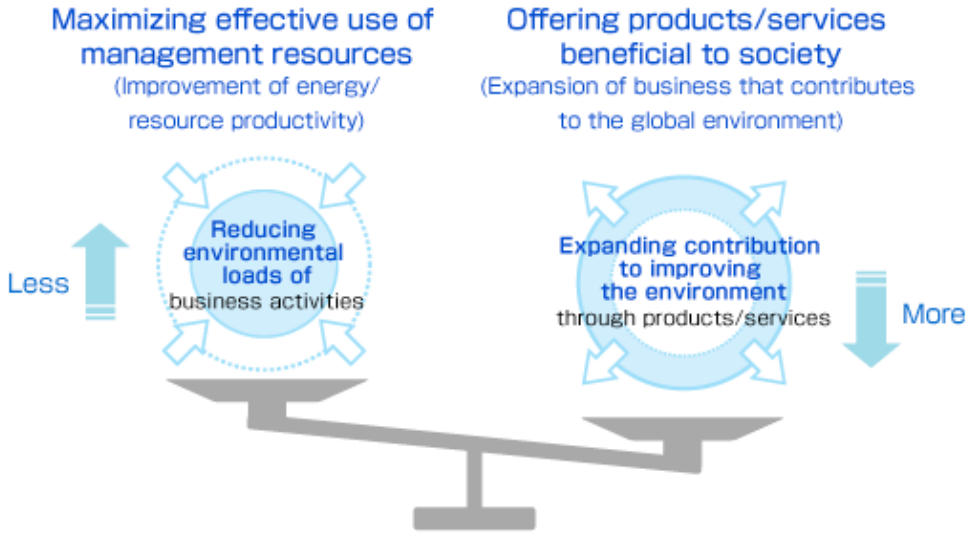
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This transparency is what makes their social responsibility initiative so successful as they bolster their public image while simultaneously providing support for tangible environmental change and also reducing costs in areas such as electricity and paper usage. Although Mitsubishi does not have any environmental education programs in place to directly augment environmental literacy in their communities or for their employees, their partnerships have helped start and sustain many environmental justice, protection, and education programs around the world. Thus Mitsubishi Corporation is one example of how large businesses' environmental and

social responsibility plans help to promote environmental awareness and literacy.

OMRON Global

Whereas the Mitsubishi Corporation provided an example of a corporation partnering with non-profits to promote environmental awareness and literacy, OMRON Global provides an example of a corporation actively promoting environmental awareness and education through programs and initiatives within their communities and employees. In 1996, OMRON established their 'Group's Environmental Policy' which was initially aimed at "reducing CO2 emissions and amount of waste associated with business activities in Japan" (OMRON.com) However, since then their environmental policy initiative has grown to encompass much more than reducing emissions and waste, as it has grown into a full-scale corporate citizenship movement.



As reflected by the graphic above, OMRON is dedicated to increasing their contributions to improving the environment; and they are doing this several ways. OMRON has implemented environmental education programs for all new hires in which new employees participate in classes and workshops to inform them about environmental issues, how the company is working to solve them, and how they can contribute on a personal level to solving these problems. Furthermore, OMRON's website explains that a rewards system has been put in place through which employees can earn points (it was unclear what can be redeemed with points) by participating in volunteer events within their communities such as forest cleanups and environmental education workshops. Lastly, all of their performance data regarding environmental management such as CO2 emissions and waste information about their products can be found on the website (OMRON.com), further promoting the CSR total package through seemingly full transparency. OMRON truly seems to be a leader in corporate action for environmental education, and all of the evidence found on their website seems to support the notion that they truly are dedicated to fostering genuine concern and action for environmental issues among their employees, as well as through their business practices. OMRON should serve as a model for other global corporations, showing that economic vitality need not be sacrificed through efforts to benefit the environment and society.

Hecho en Costa Rica Project

The two case studies above are examples of how large corporations can contribute to the environmental education and literacy gap through different levels and types of involvement and implementation of socially and environmentally responsible techniques. However, I believe that small business, though they have less political clout can also make a difference in their communities when it comes to environmental literacy and environmental justice.

In the Spring of 2012, I studied abroad in Costa Rica, and while there I was fortunate enough to complete an internship with a small business in the town of Monteverde, which is high in the Tilaran mountain range and home to one of the most biodiverse cloud forests in the world. The small business I worked with was called *Hecho en Costa Rica* and the owner and founder Orlando Calvo started the business in hopes of becoming the areas first true “green” business and serving as a model for other local business to do the same. The business consists of a small store in the town center, where Orlando sells souvenirs and jewelry made by local artisans, from locally gathered materials. These products are also often made from recycled or upcycled materials, and range from purses to ashtrays and necklaces. As an intern with *Hecho en Costa Rica*, it was my job to help Orlando make his business as socially and environmentally responsible as possible, and this

included helping him turn his business into something more. One of his main goals when he started this business was also to create a source of environmental education and awareness in the town center, where tourists and locals alike could go for information regarding environmental issues and ways to address them locally.

Therefore, as Orlando was pursuing a small business form of CSR, my first task was to evaluate all of his business practices, including his carbon footprint, and come up with a plan to minimize his environmental impact. Orlando had already done well by only purchasing products made locally, as this significantly reduces his carbon footprint by cutting down on transportation of goods from their origin to his store. Furthermore, I calculated the carbon footprint of his travels when meeting vendor and buying products and combined it with the carbon footprint of the electricity usage in his store since those were his main business activities. After gathering the figures of carbon emissions per year, I made a plan to neutralize his carbon footprint. Orlando is fortunate enough to own a large farm area in rural Monteverde, and in order to neutralize his carbon footprint I researched native trees that were efficient in sequestering carbon and calculated how many of each species it would take to offset his current carbon emissions when the trees are fully grown and at their maximum potential of carbon sequestration, which is approximately 11 years. After the plan for carbon neutralization was complete, I proceeded to pursue the

environmental education and justice portion of social and environmentally responsible business practices. In order to do so, I went door to door in the town, surveying locals about knowledge of environmental issues in their community in order to determine the basic environmental literacy levels and hopefully to determine what some of the main issues in the town were. The survey results showed that the overwhelming overarching issue in Monteverde was waste management. Most of the locals knew that recycling was important, but did not truly know why it was important, and I discovered that Monteverde does not have a recycling program. In fact the closest thing they have to it is a truck that a local conservation group drives to the center of town each month to load up with recyclables and drive down to the nearest recycling processing plant which is hours away. I saw this as an issue of environmental justice, because many people saved their recyclables each month because they were eager to participate in an activity they thought to be beneficial to preserving the unique ecosystems that surround them, but often times were turned away at the monthly recycling pick up because there simply wasn't enough room in the truck for everybody's recycling. The people of this town have a low average education with only 29% of the surveyed people completing some level of college education. Thus this may be a case of low-resistance community targeting, as the government does not seem to have any intentions of implementing a recycling program in this small town that generates a great deal of waste

and recyclable products due to the high influx of tourists that visit the famous cloud forest. So, I decided to organize a workshop in the town center, to which I invited all the locals who participated in my survey, as well as all of the host families of the other students in my study abroad program. The workshop focused on issues of waste management, with guest speakers from the local conservation organization, and was an excellent source of environmental education for the community. Additionally, Orlando invited many of the local artists who supply his store to come and demonstrate how they make many of their products from recycled materials, as well as local artists who focus on making art from trash. Lastly, I included fun, educational games for the children with topics of recycling, and environmental protection with products from the *Hecho en Costa Rica* store as prizes for them.

Ultimately, this small business in Monteverde, Costa Rica was able to hit the nail on the head as far as CSR and the triple bottom line go. Selling locally made products supports the local economy, and sponsoring an educational workshop benefits the economic interests of the store by providing positive and creative marketing strategies. Putting on the workshop set a precedent which Orlando plans on continuing on a monthly basis, and provides a positive service for society; specifically the local community. And lastly, the use of recyclables and trash as materials for jewelry, art, and souvenirs means less waste and essentially a positive step

in the right direction as far as environmental preservation and conservation. Below are images depicting some of the products made locally and sold in the store. The last image is a bingo board used for children's educational games in the local workshop, the bingo boards were made from cardboard taken from garbage bins around town and the decorations are bottlecaps.



Necklace made from a petrified slice of a banana.



Wallet made from an old Hershey's carton.

Conclusion

Although *Hecho en Costa Rica* is succeeding in pursuing socially and environmentally responsible business practices and in turn augmenting the environmental literacy gap in Costa Rica, I believe that such a small business would normally have a difficult time doing so with the lack of manpower that many small businesses and startups experience. Orlando Calvo essentially runs all business operations on his own, and although he works tirelessly to do so, an extra hand like the one I provided during my internship can have significant impacts on productivity and achieving goals of sustainability. Fortunately for Orlando, he has a partnership with the study abroad program, and gets a new intern every semester to help him and his business grow and succeed. This leads me to a policy recommendation for local businesses and environmental education in the United States.

Many university students, as part of their financial aid packages, are awarded a work-study job within their university. The point of these jobs is to provide students with a grant, while also providing the university with employees to work various positions. Although some of these positions may prove to be beneficial to the student such as assisting a researcher in a lab or working in a department of the university which they hope to pursue a career in some day, the fact remains that many of the jobs are quite

pointless and seem to have been created solely to place students in a work-study position. Furthermore, many students who choose to pursue internships end up in non-paying internships, the reason for which could vary. But many of these internships are with small businesses or startups that simply cannot afford to pay an intern. Therefore, I am proposing a program that combines the idea of work-study with the concepts discussed above regarding small businesses and the struggle to pursue sustainability with little manpower. The EPA could form a committee that would evaluate internships advertised by small businesses as non-paying internships, and if they involve work dedicated to environmental and social responsibility, then this unpaid internship could qualify to be a substitute for a student work-study position. In other words, a student who was awarded work study does not have to choose between pursuing an unpaid internship or working a job on campus that pays. Instead, they could choose to accept the internship, and apply their work-study grant to the hours worked at the internship. This way, small businesses pursuing social and environmental responsibility could benefit from extra manpower and thus facilitate their transition to sustainable business practices without going broke hiring more employees.

Ultimately, it is essential to understand that environmental literacy is not a one sided issue. As has been discussed thoroughly in the preceding pages, the lack of environmental literacy is a problem that reaches all aspects of our society, and addressing this problem could lead to

advancements in other issues such as environmental justice and environmental economics. Though large corporations have the power and resources to make significant strides in the realm of social and environmental responsibility, I think that the small businesses are the ones who will be making the real changes in the coming years. Like I mentioned before, environmental justice starts with environmental education, and a ground up approach to environmental education is the most effective way to foster an environmentally conscious and responsible citizenry for future generations.

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