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Environmental Education Reform: Using Experiential Learning to Influence Environmental Policy-Making By Fostering a Sense of Environmental Citizenship and Eco-Literacy

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ENVIRONMENTAL EDUCATION REFORM:

USING EXPERIENTIAL LEARNING TO INFLUENCE ENVIRONMENTAL POLICYMAKING BY FOSTERING A SENSE OF ENVIRONMENTAL CITIZENSHIP AND ECO-LITERACY

Nicol Bellettiere

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Introduction: Identifying the Problem and Proposing the Solution.

The fundamental environmental problem America faces today is not a particular environmental issue, but rather, society's lack of response to environmental problems in general. This is essentially due to America's political system. We are a representative democracy where a chosen few advocate on behalf of the nation; because many elected politicians disregard environmental issues, the problem is hardly addressed. The true cause of this disinterest in environmental protection is a lack of comprehensive environmental education. If the public does not see how their behavior is wrong, then they will not understand the need for change, and will subsequently allow their elected representatives to continue ignoring environmental issues.

David Orr, an authority on education and a respected environmental educator, does an excellent job of explaining the true cause of environmental degradation. Orr explains that environmental degradation is not an issue of science. If it were, the issue would be easily solved. For example, if climate change were really as a simple as reducing carbon dioxide emissions, then society would look at the scientific evidence and accept that we have to stop burning oil. Oil would then no longer be used, and climate change would theoretically return to its natural rate. However, we all know that this would never happen because society would never give up oil. Therefore, this example of environmental degradation is not a result of oil use, but rather, society's unwillingness to change. As Orr explains in "Politics, Conservation, and Public Education," the difference between the science of environmental degradation and society's unsustainable actions is that "the former have to do with the vital signs of the planet," while "the latter have to do with the distribution of wealth, land ownership, greed, the

organization of power, and the conduct of the public business" (Orr 10). Orr attributes

society's behavior to a lack of understanding of environmental degradation, claiming that " . . .

the large gap between strong public support for the environment and the environment as a

potent national political issue is partly explained . . . by the failure of scientists to

communicate adequately to society" (Orr 11).

The key to solving environmental degradation is therefore through reforming

education in order to bridge this gap between what scientists discover and what the public

understands. Ecological scientists understand, better then anyone else, the importance of

sustainability. The problem, as urged by Orr, is that "scientists tend mostly to talk to other

scientists, and not often enough to the public or to its elected leaders" (Orr 11). Therefore,

our goal should be to teach future generations the morals that scientists fail to convey. In

doing so we can set the public up with the tools necessarily to enforce environmental values.

Orr insists that "conservation biology is a dialogue between science and political action" (Orr

11); education reform can enable the public to begin a dialogue with the few chosen leaders

presiding over the country. I argue that this reform is not easy, and requires amending current

methods of environmental education. Students must be trained to think differently, and more

importantly, to apply their new thought processes to ecological sciences.

This paper argues on behalf of environmental education reform in order to improve

America's ailing environmental politics. It does so by emphasizing the overlap between

environmental education, the history of education and American conservation, and

environmental politics. It first discusses the core differences in varying styles of education in

order to provide a context for the terminology and theories used to discuss education reform.

More specifically, I compare and contrast the differences in the thought processes each style of education encourages. Divergent thinking, which results from what is known as informal education, is necessary in order to be an ecologically aware and sustainable individual. To support my argument I conduct a case study on the American Museum of Natural History; the Museum's informal education initiatives successfully increased environmental awareness in the early 1900's. Having defined the necessity for informal environmental education, I provide a brief history of environmental education in America leading up until today. I then argue that informal environmental education must be reformed in order to limit the risk of formal education undermining the lessons taught. In order to do so, the informal pedagogy used must incorporate experiential learning to reinforce the lessons conveyed. If done correctly, informal environmental education will provide students with a sense of eco-literacy. My concluding argument discusses the potential for eco-literacy to reshape environmental politics. Eco-literacy, in conjunction with environmental citizenship, has the ability to adjust the priorities of voters towards environmental protection and sustainability. My concluding argument emphasizes this relationship between the public and politicians, and asserts that educators can capitalize on it in order to direct political agenda.

Chapter 1: The Various Methods of Pedagogy and Resulting Thought Processes.

An adequate education can foster an interest, which in turn can instill a sense of curiosity, which can then encourage an individual to pursue knowledge on his or her own. When learning transforms from something a student must do, into to something they want to do, true enlightenment occurs. Therefore, it logically follows that a proper education on environmental degradation is all the public needs to understand the importance of sustainable living. However, the truth is not as simple as the theory. As stressed by Orr, education is not the quick fix to ignorance. While this is true for a variety of factors, I argue that the main cause of this is the variability of education and thinking. There are two thought processes that occur as a result of the two primary education styles used today. These are divergent and convergent thinking.

The differences between divergent and convergent thinking are discussed by museum educators Jeanette Booth, Gerald Krockover, and Paula Woods, in *Creative Museum Methods and Educational Techniques*. The three assert that convergent thinking is based on structured learning and "right" answers; according to pedagogy experts, convergent thinking focuses on the concept that all facts will lead to a single undisputable answer. In a sharp contrast to convergent thinking, divergent thinking is based on free-flowing thought processes and the interconnectedness of ideas.[1] It emphasizes the idea that every question has multiple solutions, and therefore encourages students to think about an issue from multiple view points in order to deduce as many potential solutions as possible (see table 1.).

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[1] Booth, Krockover, and Woods, *Creative Museum Methods and Educational Techniques*., Pg 18.

Table 1. "Figure 2-1. Table 2-1. Convergent Thinking Versus Divergent Thinking."

CONVERGENT THINKING	VS	DIVERGENT THINKING
1. Docent focuses upon learning <u>right</u> answers.		1. Docent focuses upon developing the visitor's own answers.
2. Answers are <u>documented</u> by authoritative sources such as the docent.		2. Answers are based upon a visitor's ideas and research.
3. Docent focuses upon finding the <u>right</u> answers.		3. Docent focuses upon building reasons for answers.
4. Docent seeks agreement in answering questions.		4. Docent encourages disagreement and discussion to clarify issues.
5. Docent answers tend to give facts and explain systems.		5. Docent answers tend to analyze and evaluate systems.
6. Docent does not require original thoughts from the visitors.		6. Docent encourages and requires original thoughts from the visitors.

Source: Jeanette Hauck Booth, Gerald H. Krockover, and Paula R. Woods;

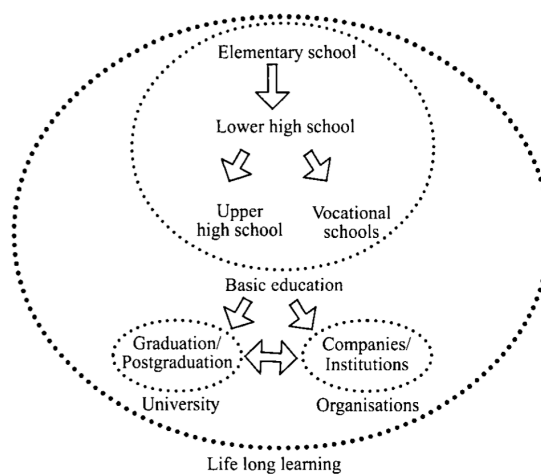*Creative Museum Methods and Educational Techniques*; (Illinois: Charles C

Thomas - Publisher, 1982); 18; Print.

Convergent thinking can result if an educator bases their teaching on a more

structured and formal style of learning. Divergent thinking contrasts from

convergent thinking in that it invokes a deeper thought process that encourages

a student to make connections in order to arrive at unique and varied answers.

The distinguishing factor that determines which thought process students use is which style of pedagogy educators utilize. Essentially, convergent thinking is enabled by what is known as formal education, while informal education typically results in divergent thinking. However, before arguing on behalf of either form of education, it is important to understand the distinction between informal and formal education.

The universally accepted definition of "formal" education is " . . . the traditional education in school, whose attributes are clear educational constructs . . ." (Romi & Schmida 260). These constructs include, for example, licensed teachers, classrooms designated by age, and rigidly structured lessons.[2] The general education process, be it formal or not, takes place over a series of periods in a student's life. According to authors Antonio Martins, Teresa Mata, and Carlos Costa, the main educational periods in a student's academic career include basic, university, organizational, and life-long (see figure 2.).

Figure 2. "Fig. 2 Educational System With The Different Levels Of Learning."

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[2] Romi, & Schmida, "Non-Formal Education: A Major Educational Force In The Postmodern Era," Pg 260.

Source: Martins, Antonio A., Teresa M. Mata, and Carlos A. V. Costa.

"Education for Sustainability: Challenges and Trends." *Clean Tech*

Environ Policy. 8 (2006): 33. Print.

Figure 2. shows the relationship between the four periods of learning defined

by scholars Antonio Martins, Teresa Mata, and Carlos Costa. They define the

entire unit as the educational system.

Basic education refers to the primary schooling all individuals receive.[3] University learning, as

the name suggests, refers to the higher level of learning students receive when they enter

college or a university program.[4] Organization and life-long learning, however, take place

once an individual has left the figurative classroom.[5] Organizational learning pertains to the

lessons learned once a student enters the job market. Lastly, life-long lessons are lessons based

on an individual's interests that are guided by personal experiences.[6] Formal education, in

theory, only applies to the initial two stages as a result of its basic core constructs; teachers,

exams, and lesson plans are not applicable outside of a classroom, and therefore do not apply

to the organizational or life-long learning periods. Formal education is therefore a limited style

of pedagogy that only applies to early academic life. It is further restrained by its specific

setting, as formal education fails to function outside of a school.

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[3] Martins, Mata, and Costa, "Education for Sustainability: Challenges and Trends," Pg 32.

[4] Martins, Mata, and Costa, "Education for Sustainability: Challenges and Trends," Pg 32.

[5] Martins, Mata, and Costa, "Education for Sustainability: Challenges and Trends," Pg 32.

[6] Martins, Mata, and Costa, "Education for Sustainability: Challenges and Trends," Pg 32.

A study conducted by Janette Griffin reveals how formal education fails when it is conducted outside of the classroom. The study focused on several groups of students brought to a museum for a field trip. The data showed that teachers attempted to keep the lesson as formal as possible[7] despite not being in a school setting. For example, some teachers gave out worksheets to their students to guide each student's thought process. Furthermore, these teachers attempted to uphold the structure of the learning experience by pulling students away from interactive exhibits that distracted them from their worksheets.[8] Griffin, in reference to an interactive exhibit, explained that "one group in particular . . . was adamant that "you don't learn anything in there - you play"," and went on to note how "if the students did ever get the chance to get into this room, they were generally chased out again by the teachers, so they could get back to "the real learning" in the specified galleries" (Griffin 124). In essence, these teachers attempted to bring the classroom to the museum. Following their trip, the students were questioned on the quality of their learning experience. The results of the study revealed the shortcomings of formal education outside of a school environment.

The data showed that students failed to learn anything from their experience in the museum. The main reason for this is that the teachers attempted to make the trip to the museum no different then a day in the classroom. The worksheets they provided, which were designed to structure the day's lesson, served only to hinder the students' learning. In fact, many of the students asserted that the worksheets prevented them from viewing the exhibits

[7] Griffin, "Learning to Learn in Informal Science Settings," Pg 123.

[8] Griffin, "Learning to Learn in Informal Science Settings," Pg 124.

they were interested in.[9] A counter argument to this statement is that that students were interested in topics that they were not meant to be studying. Therefore, by this logic, the students complaints about the worksheets is proof that the lesson was a structured success. However, the data showed that the majority of students claimed to have remembered nothing when asked what they had learned as a result of their structured visit.[10] It is therefore evident by Griffin's study that the formal education conducted outside of the classroom was a complete failure.

As explained by contemporary educator Jay Cross, formal education is typically ineffective outside of formal settings because it emphasizes a rigid structure and encourages convergent thought processes. Griffin's case study demonstrates how this structure can actually hinder a student's learning. For example, Cross refers to grades and examinations as the tools used to provide structure to a lesson. In theory, exams and the threat of poor grades encourage students to focus on learning the material that matters, and therefore prevents them from being distracted by any information that is deemed irrelevant by an instructor. As a result of this conditioning, students are trained to only learn information relevant to a particular lesson. Only learning a select portion of information is not what is detrimental, however. The problem is the implications this has on viewing a bigger picture; students are encouraged to use a convergent thought process, and are therefore discouraged from making any larger interdisciplinary connections with the material they are studying. Formal education thus fails to teach children how to think about connections or make outside parallels when

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[9] Griffin, "Learning to Learn in Informal Science Settings," Pg 124.

[10] Griffin, "Learning to Learn in Informal Science Settings," Pg 124.

problem solving. In contrast to this formal education, informal education emphasizes divergent thinking.

Informal education is essentially any type of learning that happens outside of a classroom. This includes any lessons that might be learned from watching television, reading a book, taking a trip to a foreign place, or holding a conversation with another person.[11] Informal learning can therefore take place at a number of institutions, including but not limited to botanical gardens, art galleries, zoos, parks, and museums. Due to the varying circumstances under which informal learning takes place, it is best described by what it lacks; informal education does not take place in a classroom, it does not have rigid curricula, and it never culminates in a final exam or a graduation.[12] In fact, due to its seemingly endless course, informal education can be classified as part of Martins, Mata and Costa's "life-long" learning category. Furthermore, as a result of its lack of structure, informal education is usually governed by interest. This is because, without a teacher to structure each pupil's thoughts, students are free to pursue what they are interested in. When free to choose what they want to study, learning transforms from something students have to do into to something that they want to do. This results in a capacity for knowledge and a willingness to learn that far exceeds those fostered under formal education. Most importantly, informal education differs from formal education in the style of thinking it promotes. While formal education relies on strict

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[11] Cross, *Informal Learning: Rediscovering the Natural Pathways That Inspire Innovation and Performance,* Pg 12.

[12] Cross, *Informal Learning: Rediscovering the Natural Pathways That Inspire Innovation and Performance,* Pg 17.

instruction and results in convergent thinking, informal education relies on inquiry and therefore results in divergent thinking.

Informal education results in a divergent style of thinking because it uses inquiry to teach. Inquiry, in the context of education, is a method of teaching where instructors guide their student's thoughts through a series of questions and prompts.[13] The goal of inquiry is to have students reach their own conclusions by making their own connections. Journalist Liz Suda explains that inquiry " . . . invites participants to raise questions, to listen and speak carefully, to accept and respect differences of opinion, to be willing to change their mind, and to use a range of thinking skills" (Suda 55). By continuously asking questions, instructors force their students to expand their thinking to include an increased amount of possibilities. This style of education thus teaches students not only the subject material at hand, but also how to draw abstract conclusions and how to see the bigger picture in which each subject lies. Therefore, the best way to spark divergent thinking is with inquiry. However, as Suda aptly summarizes, inquiry-based teaching is only successful in its goal if it features " . . . problem posing, dialogue, hypothesis, critical thinking, planning, organizing and documenting" (Suda 56). Therefore, while informal education can happen anywhere outside of a classroom, successful inquiry requires careful execution. In fact, it has become common practice for informal educators to invest heavily in their programs in order to maximize the effectiveness of inquiry-based teaching. Museum education programs in particular revolve around inquiry and invest heavily in its success.

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[13] Suda, "The Melbourne Story: Posing Essential Questions for Inquiry: How might inquiry learning be used to unpack the history of Melbourne?," Pg 56.

Museum education uses a particularly unique method of inquiry to encourage divergent thinking. As explained by pedagogical experts Booth, Krockover, and Woods, the inquiry used specifically in museums is unique as a result of its emphasis on fluency, flexibility, originality, elaboration, and evaluation. As explained in *Creative Museum Methods and Educational Techniques*, "fluency" is the concept of multiple answers belonging to a single problem. "Flexibility" is when a museum program facilitates " . . . thinking in a variety of categories by shifting from one approach into many different avenues or ways of thinking" (Booth, Krockover, & Woods 19). Essentially, by inspiring flexibility in a student's thought process, a museum educator can successfully encourage a fluent method of problem solving that results in multiple responses. The third concept unique to museum inquiry is "originality." Originality focuses on encouraging students to come up with unusual answers in order to facilitate innovative thinking.[14] "Elaboration" is the addition of specific facts or details to manipulate a student's interest.[15] In theory, elaborating on the subject being taught will increase a student's interests, and will thereby fuel his or her thought process. Lastly, "evaluation" involves assessing the student's ideas, and concluding on whether or not the problem presented has been effectively resolved.[16] These five methods are used, regardless of the particular subject being taught, in order to encourage divergent thinking.

As Booth, Krockover, and Woods assert, museums function as successful centers of inquiry-based informal education because each visitor is enveloped within the exhibits; each

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[14] Booth, Krockover, and Woods, *Creative Museum Methods and Educational Techniques*, Pg 19.

[15] Booth, Krockover, and Woods, *Creative Museum Methods and Educational Techniques*, Pg 20.

[16] Booth, Krockover, and Woods, *Creative Museum Methods and Educational Techniques*, Pg 20.

visitor's senses are overwhelmed with the information before them, and they inevitably find themselves " . . . developing an understanding of the content involved . . . and increasing his confidence in his ability to inquire" (Booth, Krockover, & Woods 17). The American Museum of Natural History provides a prime example of how successful this unique style of inquiry-based informal museum education can be, as it has successfully educated the public on cultural and environmental conservation since its founding in 1869.

Chapter 2: Case Study: The American Museum of Natural History As A Successful Informal
Educator.

   While the American Museum of Natural History is deeply connected to the
environmental history of America, its role in environmental protection is far from dated. In
fact, the Museum currently invests in numerous initiatives in order to advocate for
environmental conservation. Since it's initial founding, the relationship between the American
Museum of Natural History and environmental protection has been entirely based on
education. This is made evident by the initiatives of its current Center for Biodiversity and
Conservation.

   The Center for Biodiversity and Conservation is the American Museum of Natural
History's current program advocating on behalf of environmental conservation. The Center
hopes to combat " . . . threats to biological and cultural diversity . . ." (Center for Biodiversity
and Conservation) through scientific research and development. However, the Center
understands that scientific research means nothing if policymakers do not understand the
conclusions being made. Therefore, a massive element of the Center for Biodiversity and
Conservation's mission statement is "strengthening the application of science to conservation
practice and public policy" (Center for Biodiversity and Conservation). In order to do so, the
center invests in educational programs in order to teach the public about its findings and
deductions. For example, the Center hosts an annual science symposium that is " . . . designed
to foster interdisciplinary discussion of cutting-edge issues in biodiversity research and
conservation" (Center for Biodiversity and Conservation), as well as numerous exhibits on
conservation within the Museum. These initiatives all hope to influence society's behavior by

educating the public on the value of conservation. This method of using pedagogy to advocate for cultural and ecological quality is by no means foreign to the Museum or any of its programs. In fact, the American Museum of Natural History has always been dedicated to enlightening its audiences on the value of environmental and cultural preservation.

The American Museum of Natural History was built with the explicit purpose of educating New Yorkers on cultural and ecological diversity. In fact, its current mission statement is "to discover, interpret, and disseminate—through scientific research and education—knowledge about human cultures, the natural world, and the universe" (The American Museum Of Natural History) in order to put an end to the ignorance that results in environmental and cultural degradation. Similar to most museums, the American Museum of Natural History aims not to teach a select few, but rather, to teach the mass public[17] (see Photograph 3. and Photograph 4.).

Photograph 3.   Photograph 4.

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[17] Booth, Krockover, Woods, *Creative Museum Methods and Educational Techniques*, Pg 5.

One of the American Museum of Natural History's most innovative educational tools were these education trucks. Now known as the "Moveable Museums," these trucks, seen in Photograph 3., were used to deliver artifacts to communities that could not come to the Museum.[18] As shown in Photograph 4., these allowed the Museum to reach out to otherwise unavailable communities.

The Museum currently teaches the public not through lectures, but rather, through interactive exhibits. This informal education is designed to entertain the audience in order to spark an interest in the particular subjects being taught. This method of education has been effective since the Museum first opened.

The drive to build a natural history museum in New York City began during the mid-nineteenth century following the civil war.[19] New York had been growing as a city, and was quickly becoming a hub of technological development and financial growth. However, despite its many achievements, there was a distinct lack of culture and academic institutions within the city. Scholars in Boston, Philadelphia, and Washington D.C., whose respective cities boasted the Boston Society, Academy of Natural Sciences, and Smithsonian Institution,[20] looked down upon New York City. As author Douglas J. Preston states, "men of science in Boston and Philadelphia scornfully dismissed New York City as merely a center of crass commercialism, incapable of producing a museum of note" (Preston 8). In an attempt to keep

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[18] "Moveable Museum." *American Museum of Natural History*.

[19] Preston, *Dinosaurs in The Attic: An Excursion into the American Museum of Natural History,* Pg 8.

[20] Preston, *Dinosaurs in The Attic: An Excursion into the American Museum of Natural History,* Pg 8.

up with their neighboring New England cities, New York invested in numerous attempts to construct museums throughout the early 1800s.

In the late 1860's Andrew Green, the head of the Board of Commissioners of Central Park, decided to construct a museum in the park.[21] Green's intent was to build an educational Paleozoic Museum that would help bring culture to New York City. The museum would feature an array of life-sized models of American prehistoric animals[22] (see Image 5.).

Image 5.

This drawing depicts Hawkins' studio. The sculptures featured are the models

that were to be on display at the Paleozoic Museum in Central Park.

The animals would be displayed in realistic poses throughout the park, and would thereby teach basic paleontology and natural history to visitors. The Board agreed to Green's plan, and signed off on the project. They hired English sculptor Benjamin Waterhouse Hawkins to
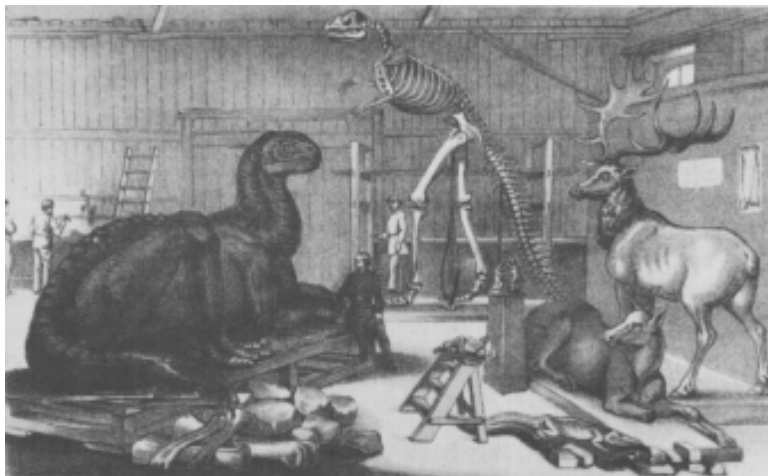
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[21]Preston, *Dinosaurs in The Attic: An Excursion into the American Museum of Natural History,* Pg 10.

[22] Preston, *Dinosaurs in The Attic: An Excursion into the American Museum of Natural History,* Pg 11.

lead the job, as Hawkins had experience modeling prehistoric creatures for a similar park in London. However, despite the promise this museum showed, it was doomed to fail. Boss Tweed, who had entered office, effectively halted construction of the museum. Claiming that the museum's construction was too expensive to pursue, Tweed ordered the city to abandon the project.[23] To prove his point, Tweed ordered his henchmen to destroy Hawkins models. As if the cancellation of the project was not enough, Hawkins' life sized prehistoric beasts were smashed to pieces and presumably buried in the park.[24] However, despite the tragic fate of Green's museum, a natural history museum was destined for New York.

Scientist and professor Albert S. Bickmore founded The American Museum of Natural History in 1869[25], following the destruction of the Paleozoic Museum. Bickmore's goal was to create the greatest natural history museum in existence. Bickmore began his endeavor by contacting and soliciting wealthy citizens. Having already collected an array of specimens for the Museum's display, Bickmore impressed these wealthy businessmen and soon made powerful connections. He found himself in the company of interested entrepreneurs, including J. Pierpont Morgan and Theodore Roosevelt Senior.[26] Together, these men wrote to the commissioners of Central Park explaining their intent to construct a museum of natural history. Having already expressed an interest in a museum for Central Park, the commissioners quickly agreed to the project (see Photograph 6. and Photograph 7.).

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[23] Preston, *Dinosaurs in The Attic: An Excursion into the American Museum of Natural History,* Pg 12.

[24] Preston, *Dinosaurs in The Attic: An Excursion into the American Museum of Natural History,* Pg 12.

[25] Preston, *Dinosaurs in The Attic: An Excursion into the American Museum of Natural History,* Pg 12.

[26] Preston, *Dinosaurs in The Attic: An Excursion into the American Museum of Natural History,* Pg 16.

Photograph 6.   Photograph 7.

Photograph 6. and Photograph 7., respectively, show the prospective layout of

the American Museum of Natural History and the first portion of it to ever be

constructed. While it was not as grandiose as originally planned, the Museum

continued to grow throughout its lifetime.

With that obstacle overcome, Bickmore now found himself face to face with the same beast

who destroyed Green's Paleozoic Museum; in order to press forward, Bickmore had to pass

the project through the New York State legislature and past Boss Tweed. Bickmore was

advised to reach out to Tweed's own allies, and called upon Samuel J. Tilden. It is still

unknown exactly what Tilden said to Tweed,[27] but it ultimately proved to be effective. The

project was approved, and the American Museum of Natural History was born.

The American Museum of Natural History began officially forwarding the cause of

environmental conservation in 1936[28] with the opening of the Akeley Hall of African

Mammals. In 1905 the Museum hired renowned taxidermist and environmental

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[27] Preston, *Dinosaurs in The Attic: An Excursion into the American Museum of Natural History,* Pg 17.

[28] Preston, *Dinosaurs in The Attic: An Excursion into the American Museum of Natural History,* Pg 92.

conservationist Carl Akeley to go to Africa and hunt a herd of elephants for display (see

Photograph 8.).   Photograph 8.

Carl Akeley is shown here mounting an elephant for display at the American

Museum of Natural History. Akeley revolutionized the art of taxidermy, and

was one of the first taxidermists to replicate muscle and bone structure in order

to perfect each animal's gait and shape.[29] Akeley's skills are often credited with

providing the dioramas with their moving realism.

The excursion was not Akeley's first trip to Africa. In fact, Akeley had seen much of Africa

over the course of numerous prior visits. Regardless of this, the trip proved to be life

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[29] Preston, *Dinosaurs in The Attic: An Excursion into the American Museum of Natural History,* Pg 92.

changing. Throughout the excursion Akeley noted that the fauna he had grown accustomed to on previous trips was disappearing as a result of overhunting and industrialization. Shaken by the realization that Africa's natural environment was endangered, Akeley returned to America intent to make a difference. He approached the American Museum of Natural History with the idea of recreating the Hall of Africa to depict the continent's native fauna.[30] The displays would be as realistic as physically possible in order to adequately show the public the beauty of the natural world. The overarching goal of Akeley's hall would be to teach visitors about the value of the environment, and in doing so, persuade the public to help conserve the natural world.[31] In 1914 the Museum signed onto the idea, and construction of the Museum's first aggressively conservationist hall began.[32]

Akeley believed that the dioramas had to be as realistic as possible in order to convince visitors of the value of environmental protection. In order to accomplish such a feat, multiple trips were taken to Africa by Akeley and his team. The entire production, including these frequent trips, was expensive, and Akeley was forced to come up with a way to finance the project. He ultimately came up with the idea of letting individuals donate to the construction of specific dioramas. In exchange for the money, the donors got their names engraved on the diorama, and the opportunity to hunt the animals being displayed.[33] Akeley's plan was successful, and the Museum was able to get the funding it needed to research Africa. As

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[30] Preston, *Dinosaurs in The Attic: An Excursion into the American Museum of Natural History,* Pg 81.

[31] Preston, *Dinosaurs in The Attic: An Excursion into the American Museum of Natural History,* Pg 81.

[32] Preston, *Dinosaurs in The Attic: An Excursion into the American Museum of Natural History,* Pg 81.

[33] Preston, *Dinosaurs in The Attic: An Excursion into the American Museum of Natural History,* Pg 83.

author Martin Kemp explains in his article on the Akeley Hall of African Mammals, "meticulous care was taken in assembling field data on every aspect of the flora, fauna, geology and meteorology of the setting" (Kemp 753) (see Photograph 9. and Photograph 10.).

Photograph 9.   Photograph 10.

Photograph 9. and Photograph 10. depict Akeley's trips to Africa.

Photograph 9. Shows Akeley taking a photograph of the landscape. Featured in Photograph 10. are some members of Akeley's crew. The multitude of equipment should be noted; the team took intense care to document as much as they could in order to bring a distinct realism to the Museum's dioramas.

Furthermore, the background image in each diorama displayed actual locations in Africa, and all of the animals mounted are real.[34] Once completed, the Akeley Hall of African Mammals embodied the first bold step taken by the Museum to support the environmental conservation movement through vivid demonstration of the natural world.

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[34] Kemp, "Akeley's Africa," Pg 395.

Akeley's attention to detail proved to be successful, and the hall became a sensation. However, not all the response to the Museum's remodeled hall was positive. At the time, museums were focusing on research as opposed to environmental outreach;[35] their halls were meant to provide information to those who pursued it, not evoke emotion and inspire change in the general public. The construction of the Akeley Hall of African Mammals, and the social statements it made, were therefore revolutionary. It was the first installment in an array of exhibits that vehemently argued on behalf of environmental conservation (see Photograph 11.).

Photograph 11.

Albeit difficult to read, the diorama depicted here proudly proclaims that

"The American Museum Stands For Conservation." Following the success of

the Akeley Hall of African Mammals, the Museum continued to advocate for

environmental conservation through educational displays such as this, which

teaches the importance of balanced and sustainable lifestyles.[36]

The American Museum of Natural History was criticized by other institutions as a result of

this innovation.[37] However, despite the negative critique it received, the Museum proved

successful in its mission to educate the public on the importance of environmental

conservation.

The American Museum of Natural History's goal to inspire environmental literacy in

the public is identical to the over-arching goal of environmental education itself. In fact, the

purpose of ecological pedagogy throughout the history of American environmental

conservation has been to teach the public about the value of environmental protection.

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[36] Coles, *Man Viewing Conservation Display, S.O.S. For A Continent.*

[37] Kemp, "Akeley's Africa," Pg 395.

Chapter 3: The History of Environmental Education.

The history of environmental education is deeply intertwined with the history of the environmental conservation movement in America. As discussed by environmental educator William B. Stapp in "Historical Setting of Environmental Education," the history of environmental conservation can be broken down into three phases consisting of preservation, management, and environmental quality.[38] In fact, environmental education in America was often referred to as "conservation education" as a result of its connection to the movement.[39] It played a part in each phase, and evolved as the environmental conservation movement advanced in America. However, despite its evolution over time, its goal has never changed. As was demonstrated by Carl Akeley's dream, the goal of environmental education throughout the multiple phases of environmental conservation has been to teach change by instilling a sense of environmental awareness in the public. This has been evident since the initial phase of the conservation movement in America.

Environmental education first began in the form of ecological publications at the start of the American preservation movement. An example of one of these publications is *Man and Nature* by George Perkins Marsh. March, who hoped to reeducate the public on the importance of sustainability, published his book as a direct response to the extensive environmental degradation that was occurring in America at the time;[40] colonial settlers, as explained by Stapp, had spend nearly 200 years viewing nature as an endless source of

[38] Stapp, "Historical Setting of Environmental Education," Pg 41.

[39] "Evolution of Environmental Education: Historical Development." *The Encyclopedia of Earth.*

[40] Stapp, "Historical Setting of Environmental Education," Pg 43.

materials and a limitless sink for pollution. This outlook lead to extensive degradation across

the country. Marsh published his novel hoping to change the public's behavior by explaining

to them the reality of natural resource depletion. Following Marsh's example, author Wilbur

Jackman published *Nature Study for the Common School* in 1891. It is important to note the

nature of Jackman's work, especially in comparison to Marsh's. Unlike Marsh's work, which

merely discussed the subject of environmental degradation, Jackman's work argued methods

of teaching environmental degradation to students.[41] His emphasis on pedagogical methods

marked a major shift in environmental education; environmental education shifted away from

being a type of literature emphasizing sustainability and towards being a form of actual

pedagogy. In fact, shortly after this shift in dynamic, Cornell University founded America's

first forestry college.[42] The founding of Cornell's forestry school represented the evolution of

environmental education from a subject material read on an individual's own time and into a

field that was formally pursued in a university classroom amongst peers.

The evolution of environmental education continued with the rise of what Stapp refers

to as the environmental management movement in America. During this period the

government began to contribute to environmental protection under the guidance of President

Theodore Roosevelt. Numerous conservation agencies were subsequently created with the

purpose of providing an environmental education to members of society who remained

outside of the classroom. This was an early example of informal environmental education. In

order to educate the public, conservation agencies invested in a number of initiatives,

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[41] Stapp, "Historical Setting of Environmental Education," Pg 44.

[42] Stapp, "Historical Setting of Environmental Education," Pg 44.

including the production of informative films, the hosting of interactive conferences, and the distribution of pro-conservation publications.[43] These initiatives popularized the idea of environmental sustainability, and by the 1930's the public was insisting that environmental education, which was solely a collegiate-level field of study at the time, be brought into the public school classroom. This marked a defining moment in environmental education as well as the start of the third and current phase of environmental conservation.

The role of environmental education in the third phase of envnrionmental conservation in America carries on today and raises the issue of education reform. This third phase, as defined by Stapp, is the ongoing fight for improving environmental quality. In theory, following the demand for environmental protection that occurred as a result of the government's endorsement of conservation, today's generation should embrace environmental sustainability and advocate on behalf of restoring ecological quality. The enactment of legislations such as the National Environmental Education Act of 1990,[44] which created the education department of the Environmental Protection Agency, theoretically prove this assumption to be true. However, this is not the case due to the shift in education style following the second phase of the conservation movement. In essence, environmental education went from being taught in a formal classroom to being informally taught in informal settings. However, it is now attempting to return to the classroom. It is for this reason that environmental education, despite a long history of evolution and progress, has begun to falter.

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[43] Stapp, "Historical Setting of Environmental Education," Pg 46.

[44] Theobald and Ronchon, "Environmental Education," Pg 329.

Environmental education, for several reasons, is best taught informally. Many will argue that environmental education can work well in a classroom, especially given that it began in universities and appeared to successfully influence the thinkers who initiated the second phase of the environmental conservation movement in America. However, those who argue such a point do not understand that many revolutionary environmentalists of the late 1800's were not effected by formal environmental education, but rather, by informal methods of teaching. An example of this was Theodore Roosevelt Junior, who received his environmental education not from a classroom, but from the informally educational American Museum of Natural History.

Chapter 4: Case Study: Theodore Roosevelt and The Effects of Informal Environmental Education.

Theodore "Teddy" Roosevelt Junior was first introduced to the American Museum of Natural History by his father, Theodore Roosevelt Senior. Roosevelt Senior saw to it that each of his children had an in-depth environmental education. This not only included bringing them on frequent trips into the wilderness,[45] but also involved bringing them to the American Museum of Natural History. Roosevelt Junior spent much of his youth studying the Museum's many halls since it opened in 1877, and was therefore one of the first few citizens to experience the Museum's informal style of environmental education. The education he received at the Museum amplified the one he received from his father; Roosevelt Senior supported Charles Darwin, and provided his son with a copy of *On The Origin of Species* during the boy's childhood. Author Douglas Brinkley, in a biography of Roosevelt Junior, sums up the effect Darwin had on the future president; having read *On The Origin of Species,* Roosevelt Junior " . . . decided to become a foot solider in the Darwinian 'revolution of natural history'" (Brinkley 61), and "for the rest of his life . . . used evolutionary theory as his guiding light . . ." (Brinkley 64). The effects of this early education in ecology and natural history were evident as he grew older. As Brinkley explains, "nobody would have guessed that Theodore Jr., running around the museum excited about a mammoth tooth and a badger claw, would decades later have a wing of the museum dedicated in his honor for his efforts on behalf of U.S. conservation" (Brinkley 45).

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[45] Brinkley. *The Wilderness Warrior: Theodore Roosevelt And the Crusade For America*, Pg 43.

Theodore Roosevelt Junior was a visionary conservationist as a result of his

environmental education. Having been brought up to respect nature, he became an avid

outdoorsman in his adult life (see Photograph 12. and Image 13.).

Photograph 12.   Image 13.

These images are of a young Theodore Roosevelt Junior. An avid hunter,

Roosevelt Junior was a proud sportsman who created the Boone and Crockett

Club. The club proudly boasted their founder as their poster child.

Roosevelt Junior spent as much of his time as he could exploring the untamed wilderness of

America's rural inland. However, as time passed and as America industrialized, the wilderness

began to disappear. The future president found himself increasingly disturbed over the loss of

America's big game and natural landscape. Similar to Carl Akeley's concern for Africa,

Roosevelt Junior feared for the future of America's environment. Unwilling to accept the loss of America's wilderness, Roosevelt Junior took initiative and founded the Boone and Crockett Club,[46] thereby embarking on what would become a historic conservationist career.

Inspired by the role his father played in environmental history, Theodore Roosevelt Junior created the Boone and Crockett Club with the intent to unite " . . . high-powered sportsmen like himself . . . to lead a new wildlife protection movement" (Brinkley 201). Roosevelt Junior recruited a group of twelve like-minded frontiersmen; Roosevelt Junior was strategic in who he allowed into the club, as he did not want the club to lose sight of its overarching goal to preserve the American wilderness. Roosevelt Junior limited membership to fellow conservationist hunters, and restricted associate membership to writers, politicians, scientists, and public figures.[47] In doing so Roosevelt Junior hoped to bring together an elite and influential group of people who were capable of advocating for conservation efficiently and effectively. Their initial goals included, among other objectives, to promote hunting, exploration, and an appreciation of the American frontier, as well as advocate for the preservation of the nation's big game.[48] Still operational today, the club's initiatives have changed little, and are currently " . . . to promote the conservation and management of wildlife . . . and its habitat, to preserve and encourage hunting and to maintain the highest ethical standards of fair chase and sportsmanship in North America" (Boone and Crockett Club).

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[46] Brinkley, *The Wilderness Warrior: Theodore Roosevelt And the Crusade For America*, Pg 202.

[47] Brinkley, *The Wilderness Warrior: Theodore Roosevelt And the Crusade For America*, Pg 203.

[48] Brinkley, *The Wilderness Warrior: Theodore Roosevelt And the Crusade For America*, Pg 204.

The Boone and Crockett Club boasts a long list of environmental achievements since its initial founding. The club is credited with popularizing the issue of environmental preservation[49] in the late 1880s, and was a vicious lobbying force. The club often bullied politicians into supporting their initiatives to regulate hunting and enforce state park regulations. They accused any man who refused to see things their way as lacking a true sense of sportsmanship, thereby shaming any public figures who refused to assist their cause. While their methods might have been crude, environmental historians consider them to have been enormously successful. In fact, Brinkley asserts that Theodore Roosevelt's Boone and Crockett Club was " . . . the first wildlife conservation group to lobby effectively on behalf of big game" (Brinkley 206). Had it not been for Roosevelt Junior's informal environmental education, this powerful conservationist force would have never come to existence.

In the summer of 2011 I experienced the same unique style of pedagogy that influenced Roosevelt Junior from the point of view of a participating educator as part of the Museum Education and Employment Program at the American Museum of Natural History. The program trains college students to teach an array of visitors each day on various subjects ranging from cultural anthropology to paleontology or zoology. In doing so, the Museum hopes to improve the quality of its visitor's experiences while giving novice educators relevant experiences in pedagogy. I personally focused on using the Museum's exhibits to teach the conservationist message that Carl Akeley hoped to promote by focusing my lesson plans on ecology and conservation sciences.

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[49] Brinkley, *The Wilderness Warrior: Theodore Roosevelt And the Crusade For America*, Pg 206.

My experiences teaching at the Museum made me realize that environmental education needs to be taught through experience, not lecture. My lesson plans focused on teaching about the dangers of deforestation by emphasizing the interconnections between organisms in an ecosystem. I began by showing kids dioramas emphasizing the relationships between organisms in an ecosystem. I would then bring them to the Museum's mock-rain forest exhibit. I would show them how removing a single element, which in this case was the trees, can destroy the balance within an ecosystem. The students, who were usually bored at the start of each lesson, would always become enthralled with their setting; even if they were not initially interested in what I was teaching, they could not help but become fascinated as they walked through the life-size model rain forest. In other words, my students, bored with a lesson on deforestation that they most likely have already heard, were immediately brought to attention when they were given a hands-on lesson that involved actually walking through a deforested ecosystem. Their interest was ignited when the convergent lecture they had received in a classroom turned into a divergent experience at the Museum.

The interest my students took in the Museum's ecological exhibits demonstrated how informal education in particular is a successful tool for encouraging environmental awareness. In theory, modern environmental education can utilize informal teaching to spark the interests of the public with interactive displays in a manner similar to Akeley's hall and my own lesson plans. However, this is not the only reason why informal pedagogy is best for teaching environmental education. Informal education also provides students with the thought processes necessary to grasp an understanding of the ecological issues that environmental education addresses.

Chapter 5: Reforming Environmental Education And its Ability to Increase Eco-Literacy.

My teaching experiences enabled me to analyze the effectiveness of different styles of environmental education, and have proven to me that inquiry-based informal environmental education is the only method capable of successfully teaching environmental studies. This is due to the nature of the environmental problems being taught; environmental problems are vastly complex. The only way for students to comprehend complex ecological problems is if they master a divergent thought process. Furthermore, if environmental education can covey the importance of conservation whilst enabling students to think divergently, then it can foster a sense of eco-literacy. Eco-literacy is a form of environmental awareness that involves viewing the environment as a series of connections,[50] and therefore enables an individual to understand the effects of environmental problems to the highest extent. However, due to its interconnected nature, eco-literacy is only attainable if an individual is capable of making connections between concepts. In other words, in order to instill a sense of eco-literacy and an understanding of ecological problems, educators must encourage divergent thinking in their students.

Due to the interconnected nature of ecological problems, divergent thinking is critical in order to achieve a full understanding of environmental degradation. "Ecological" issues usually pertain to damages done to ecosystems. Therefore, understanding how severe ecological degradation is means understanding how damaged an ecosystem is. However, damage assessment of ecosystems is difficult due to the nature of ecosystems. Natural life exists in a series of interconnected relationships. One example of these relationships is the

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[50] Peacock, *Eco-Literacy For Primary Schools*, Pg 15.

food web. This web is organized by a series of levels divided by the different consumption rates between predators and prey; organisms on each level consume the organisms on the level below it. Therefore, due to this high degree of interconnectedness, damage done to single level of the food web effects all other levels. For example, lets say Organism A feeds on Organism B, which in turn feeds on Organism C. One could argue that the extinction of Organism A would be beneficial, as then Organism B would be without any predators and would increase in population. However, the increased population of Organism B would put a strain on the population of Organism C. Organism C would thus be over-hunted by the surplus of Organism B, and would begin to die out. In turn, any organisms eaten by Organism C would overpopulate due to the loss of their natural predator, and the pattern would continue. As this example shows, ecological processes involve a series of interconnections and relationships. Therefore, in order to understand the chain reactions and consequences of ecological degradation, people need to be able to comprehend the interconnectedness of the damages.

Convergent thinking and formal education, which focus on limited thought processes and minimal connections between disciplines, fail to accurately teach these ecological problems and their subsequent effects on the environment. Orr explains that formal environmental education " . . . emphasizes theories, not values; abstraction rather than consciousness; neat answers instead of questions; and technical efficiency over conscience" (Orr 8). These limited thought processes do not enable students to understand the severity of ecological issues due to the fact that, as a result of their narrow mindedness, students are incapable of stepping back and viewing every possible connection between ecological problems and environmental health. Therefore, they fail to understand the over-arching

benefits of environmental protection, and will not understand the need to reform their behavior; they fail to understand that degradation refers to the damages incurred onto Man in addition to those imposed on an ecosystem. In order for an individual to be aware of a problem's full set of consequences, he or she must be capable of divergent and multifaceted thinking.

In addition to understanding ecological problems, divergent thought processes will enable children to develop a thorough and interdisciplinary sense of eco-literacy. Eco-literacy, in a brief summation, is " . . . understanding how ecosystems are organized and using these principles to live by" (Peacock 15). Alan Peacock, a pedagogy expert and author of *Eco-Literacy For Primary Schools*," stresses the importance of being ecologically literate by explaining that it allows individuals to ". . . draw together the important dimensions of science, humanities, and citizenship that are essential for children to understand what we have to do to ensure our continued survival on the planet" (Peacock 8). Therefore, the same divergent thought process that enables an understanding of ecological problems will also enable students to connect multiple disciplines and view said problems with various implications and contexts in mind. According to the Environmental Protection Agency, this interdisciplinary eco-literacy enables students to care about environmental issues, be knowledgeable of environmental problems, have a drive to protect the environment, and be inclined to participate in environmental protection.[51] Thus, ecological literacy does not only refer to an understanding of ecological issues; eco-literacy refers to an individual's ability to analyze

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[51] "Environmental Education and Literacy." *US Environmental Protection Agency*.

issues, understand the need for intervention, and willingness to contribute to the conservation movement.

As Peacock explains, the environmental responsibility and the sense of ecological awareness that accompany eco-literacy hinge on an individual's ability to understand the interconnectedness of envnrionmental issues and ecological problems. It thus follows that the very same divergent thinking that enables an understanding of ecological issues is critical to attaining a sense of eco-literacy. Thus, we can conclude that the pedagogy used to teach environmental education is a massive factor in whether or not a student gains a sense of eco-literacy. I therefore argue that environmental education must be reformed in order to emphasize the proper teaching methods.

Chapter 6: Reforming Environmental Education to Meet its Full Potential.

Environmental education is not as consistently effective as it could be. As argued by educator Stephen Sterling in *Sustainable Education: Re-visioning Learning and Change*, "education for change is often outweighed by the larger educational system which enacts vocational or socializing roles and purposes, and can 'cancel out' radical educational endeavor" (Sterling 32). What Sterling is referring to here is the formal education system that reinforces narrow mindedness, indisputable conclusions, and the pursuit of a single "right" answer. Due to its nature, students inevitably receive a greater reinforcement of formal education then they do of informal education; students must go to class and obey the ridged structures of their teachers everyday, while informal educational experiences are done on their own time. As pointed out by Sterling, this has disastrous implications for the effectiveness of informal environmental education as it causes informal education to be taken less seriously. Griffin's article offered proof of this; her results showed that students " . . . seem to identify learning almost exclusively with the type of activities which go on at school, especially pen and paper activities" (Griffin 124). As this example demonstrates, it is not uncommon for lessons learned in an informal setting to be overwhelmed and overruled by the consistent reinforcement of formal education. Informal environmental education must therefore be taught in a manner that reinforces the lessons learned. If the proper method of informal education is used there would be no room for formal education to enter the discussion and undermine its authority

Environmental education must be taught with experiential learning in order to reinforce the subject material being taught. Experiential environmental education, as defined by environmental educator Richard Louv, teaches students about ecological processes by

having them experience those processes for themselves.[52] It is a method of informal education

that teaches through the most extreme type of interactions possible; as opposed to

experiencing a lesson on horticulture through a museum exhibit, for example, experiential

learning would involve actual farming. This particular style of informal education would not

only encourage a sense of divergent thinking, but would also channel that thinking through

hand's on interaction with the subject matter being taught. Louv argues on behalf of

experiential learning by discussing a case study on schools in Finland. These schools use

experiential learning to teach about environmental sustainability, and have successfully

pushed large portions of public school education outside of the classroom and into the

surrounding communities.[53] The success of these programs is their ability to guide divergent

thinking to focus on ecological issues, thereby fostering am "ecological viewpoint" in students.

As case studies show, experiential environmental education has the potential to

facilitate eco-literacy by encouraging what Sterling refers to as an "ecological viewpoint." This

viewpoint emphasizes the concept of relationships within nature, as well as the connections

between nature and society.[54] According to Sterling, "such thinking is systematic rather than

linear, integrative rather than fragmentary" (Sterling 16). Evidence of experiential learning's

ability to inspire an ecological viewpoint was seen in a Turkish case study. The study,

conducted in 2008, studied the effects an environmental summer camp had on students. The

study recorded how the experiential program affected each student's environmental

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[52] Louv, *Last Child In The Woods: Saving Our Children From Nature-Deficit Disorder*, Pg 203.

[53] Louv, *Last Child In The Woods: Saving Our Children From Nature-Deficit Disorder*, Pg 205.

[54] Sterling, *Sustainable Education: Re-Visioning Learning and Change*, Pg 16.

knowledge, environmental attitudes, environmental sensitivity, and responsible environmental behavior. The results can be seen in Table 14. (see Table 14.).

Table 14. "Table 1. Paired T-Test Scores And Pretest Posttest Comparisons."

Table 1
Paired T-Test Scores and Pretest Posttest Comparisons

Dimensions	Test	n*	Min-Max	Average	SS	ANCOVA / t test
Environmental knowledge	Pretest	61	4-14	9.8	2.83	Wilks's Λ= .96, F (1, 59) = 2,45*
	Posttest	61	6-15	10.62	2.36	
Willingness to act	Pretest	54	5-20	17.48	3.34	-1.56*
	Posttest	54		18.05	2.64	
Environmental Attitudes	Pretest	55	5-20	19.63	.94	.41*
	Posttest	55		19.56	1.10	
Environmental Sensitivity	Pretest	55	4-16	13.16	2.97	-1.32*
	Posttest	55		13.60	2.38	
Responsible Environmental Behavior	Pretest	53	21-36	29.42	3.93	-3.33**, η^2 = .17
	Posttest	53	23-36	30.70	4.20	

* $p>.05$, ** $p<.01$

Source: Erdogan, Mehmet. "The Effects of Ecology-Based Summer Nature Education Program on Primary School Students' Environmental Knowledge, Environmental Affect and Responsible Environmental Behavior." *Educational Sciences: Theory & Practice*. 11.4 (2011): 2235. Print.

Table 14. displays the results of a study on environmental awareness and experiential learning. As the results show, children's environmental behavior increased following their experiences at an interactive ecology camp. This

evidence supports the claim that experiential learning is an effective method of teaching informal environmental education.

The results of the case study regarding the effectiveness of experiential environmental education showed that, while the average student's environmental knowledge did not increase significantly,[55] attending the ecology camp drastically improved the majority of students' environmental behavior. The author of the study, Mehmet Erdogan, attributes this to the interactive and informal nature of the camp, claiming that the students' " . . . outdoor activities provide hands-on activities which enable the students to integrate theory and practice, and to attain cognitive attainments" (Erdogan 2235.) According to Erdgogan, the outdoor learning inspired the students to witness and experience the connections within nature, thereby enabling them to develop their own connections with their environment. In turn, they developed a sense of responsibility for the environment with which they had connected. Thus, we can conclude that the interactive nature of the experiential lessons inspired each student to take on an ecological viewpoint; they viewed the environment as an array of interconnected relationships, and through the process of divergent thinking, viewed themselves as one of nature's numerous connections.

In addition to reforming the style of informal pedagogy used, environmental education can benefit from adjusting its goals in two critical ways. Orr touches upon both of these reforms in *Each In Mind*. The first major goal of environmental education should be to bridge the gap between awareness of environmental issues and compassion for nature. When we care

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[55] Erdogan, "The Effects of Ecology-Based Summer Nature Education Program on Primary School Students' Environmental Knowledge, Environmental Affect and Responsible Environmental Behavior," Pg 2235.

about an entity's wellbeing, we strive to protect it from harm. If educators can teach students to emotionally value nature, then they provide students with an array of reasons to protect the environment. In *Earth In Mind* Orr describes this critical reform, and argues that "there is no way to separate feeling from knowledge . . . science without passion and love can give us no reason to appreciate the sunset . . . " (Orr 31-32). The second major goal Orr also touches upon is that informal environmental education must focus on teaching students to take responsibility as part of nature's interconnected community. Increasing students' sense of environmental awareness is meaningless if they do not take action as a result. According to Orr, in order to establish this sense of environmental responsibility, the public must view themselves as citizens of nature.[56] If environmental education is successful in this goal, and students begin to view themselves as citizens of nature, they will subsequently be inclined to protect their newfound biotic community. It thus follows that, due to the nature of American government, the only way for an eco-literate public to accomplish this goal to protect their environmental community would be through environmental politics.

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[56] Orr, *Earth In Mind*, Pg 32.

Chapter 7: Environmental Politics and The Influence of Environmental Education.

Environmental policy is a crippled subfield of politics that is often ignored by politicians and policymakers. Despite the fact that each issue facing America is as equally important as the next, environmental protection is usually seen as less of a priority compared to other national issues.[57] However, there are times when environmental problems become an undisputable priority to society. These intense, albeit brief, periods of public environmentalism are usually a result of an environmental disaster, and are usually when the majority of environmental regulations are passed. This correlation demonstrates how important education is in effecting public opinion. In fact, once people become educated on the need for environmental protection, a sense of environmental citizenship is inspired, and the public can begin to utilize its power over government to enforce changes and influence the creation of environmental policy.

Environmental issues typically become relevant during times of environmental crisis because each crisis is an informal educational experience for the public. A classic example of this was seen in the late 1960s when America suffered several major oil spills.[58] The spills educated the public on environmental degradation; oil washed up on shore, animals died, and the media covered the news consistently. Suddenly the public was bombarded with lectures on the consequences of environmental degradation and unsustainable behavior. Similar instances happened earlier in the 1960's, when Rachel Carson's *Silent Spring* was released.[59]

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[57] Vaughn, *Environmental Politics: Domestic and Global Dimensions,* Pg 7.

[58] Vaughn, *Environmental Politics: Domestic and Global Dimensions,* Pg 14.

[59] Vaughn, *Environmental Politics: Domestic and Global Dimensions*, Pg 14.

Silent Spring was monumental for several reasons, including the fact that it spoke out against

the use of one of most common pesticides at the time. Thus, the 1960's proved to be a decade

of constant environmental devastation, and subsequently, a year of informal environmental

education. This heightened society's environmental awareness, as is made evident by the

behavior of the public at the time. In fact, roughly 72 million citizens were visiting national

parks, membership of the preservationist Sierra Club has increased tenfold, and the

Wilderness Society had grown to nearly five times it size.[60]

Due to the staggering spike in environmental consciousness, policymakers of the

1960's had no choice but to cater to the demands of the newly conservationist public. In fact,

to quote professor Jacqueline Vaughn, "legislatively, the 1960s heralded a period of intense

activity" (Vaughn 14). Over the course of this single decade the Land and Water

Conservation Fund was created, and the National Wilderness Act, Wild and Scenic Rivers

Act, National Trails Act, Clean Air Act, Water Quality Act, and the Endangered Species Act

were all passed.[61] This environmental movement eventually lead up to the creation of the

Environmental Protection Agency in 1970 by President Richard Nixon.[62]

If this decade is proof of anything, it is that education has the power to influence the

public to change political agenda. As Vaughn describes, this environmental legislation

movement was the product of legislators hoping to " . . . take advantage of the public's mood"

(Vaughn 17). For example, Nixon did not create the Environmental Protection Agency out of

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[60] Vaughn, *Environmental Politics: Domestic and Global Dimensions*, Pg 15.

[61] Vaughn, *Environmental Politics: Domestic and Global Dimensions*, Pg 15.

[62] Vaughn, *Environmental Politics: Domestic and Global Dimensions*, Pg 17.

genuine concern for the environment. He did so because he found himself leading a country distraught over oil spills, air pollution, and pesticide poisoning. In fact, Nixon was concerned with approval ratings, not environmental degradation. As cruel as it that might seem, politicians' desire to please their constituents is an effective instrument for change; due to the nature of America's electoral system, the public has the power to manipulate politicians through popular demand.

The ability to influence politicians is a direct result of the structure of American politics. According to lecturer Michael Howes, two important players in the game of American politics are the "state" and the "community" (Howes, xx). The state refers to all forms of government,[63] including the executive office, legislature, judicial body, and bureaucracies. In turn, the community is a blanket term referring to participating voters and lobbyists.[64] The community's has power over the state as a result of electoral politics; in America, members of the state must run for election in order to gain power. The community must choose who they want in control, and therefore elections often turn into a system of negotiations between what the community wants and what the state has to offer. However, despite the power the community has, the state has the tendency to do as it pleases. This is primarily due to the fact that many people fail to understand the power they have over the state. However, when voters are aware of their powers and demand change, as was seen in the 1960's, politicians almost immediately respond. Therefore, members of the community who are aware of this relationship take it upon themselves to advocate for certain causes and drive

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[63] Howes, *Politics and the Environment: Risk and the Role of Government and Industry,* Pg xx.

[64] Howes, *Politics and the Environment: Risk and the Role of Government and Industry*, Pg xx.

the greater public to utilize their power. These lobbying groups include environmental organizations such as the League of Conservation Voters.

The League of Conservation Voters is a non-profit organization that advocates for environmental legislative action in an attempt to awaken a sense of environmental responsibility in the public.[65] In particular, the organization works to rally together environmentally conscious voters in order to influence elections. Through what is ironically known as "grassroots lobbying," the organization goes out into the community and presents voters with information on current environmental legislation with the hope of educating voters on environmental developments.[66] In addition to circulating information on particular legislations, the League of Conservation Voters also runs campaigns in support of environmentally conscious politicians and legislators.[67] By lobbying the community to make more environmentally conscious electoral decisions, the League of Conservation Voters hopes to ignite the public's sense of environmental citizenship.

To quote the *Encyclopedia of Environmental Ethics and Philosophy*, environmental citizenship is the notion that " . . . each of us is an integral part of a larger ecosystem and that our future depends on each of us embracing the challenge and acting responsibly and positively toward our environment" (Hargrove 323). While there are many interpretations of what constitutes as environmental citizenship, the over-arching theme is responsibility. Environmental citizens base their everyday actions not on convenience, but on what is the

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[65] "About LCV." *Lcv.org*.

[66] "About LCV." *Lcv.org*.

[67] "About LCV." *Lcv.org*.

most sustainable for the environment. As explained by the *Encyclopedia of Environmental Ethics and Philosophy*, there are no set rules for what an individual must do in order to be an environmental citizen. This is due to the varying conditions of people across the country;[68] an individual of lower class might not be able to afford to make the same sustainable decisions as another individual of a wealthier status. Therefore, environmental citizenship is contextual. As long as an individual is eco-literate and actively making environmentally conscious decisions, then he or she is an environmental citizen. In essence, environmental citizenship is the communal responsibility that Orr insists must be promoted by environmental education. It channels the awareness of the eco-literate into a drive to promote change and advocate legislators to improve America's quality of environmental policymaking.

Inspiring the eco-literate to advocate for policy change is impossible without understanding the multistep process of environmental policymaking. The three most vital steps, as outlined by Vaughn, include problem identification, policy formulation, and policy evaluation. According to Vaughn, problem identification involves determining the issues that must be addressed by politicians. This leads into the second step of policy formation. This step takes place once a problem is identified and policymakers respond with appropriate initiatives and legislation.[69] The final step is policy evaluation.[70] If a policy is viewed as ineffective once it has been put in place, it will either be reformed or removed. The public's thought process, which guides how they will review a policy, greatly shapes this aspect of the policymaking

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[68] Hargrove, "Environmental Citizenship," Pg 325.

[69] Vaughn, *Environmental Politics: Domestic and Global Dimensions*, Pg. 3.

[70] Vaughn, *Environmental Politics: Domestic and Global Dimensions*, Pg 4.

process; if the public views a policy as ineffective and incapable of reform, the policy will most likely be destroyed. Given these particular aspects of environmental policymaking, it becomes clear how environmental education can be influential in drafting legislation.

The first and last steps are where environmental education can interject in the policymaking process. As Vaughn asserts, the "conditions become problems when there is sufficient belief that something ought to be done about them . . ." (Vaughn 3). By utilizing the methods of experiential environmental education to inspire eco-literacy and environmental citizenship, educators can encourage the public to redefine what is acceptable in terms of environmental degradation. Once educators have influenced environmental citizens into setting new environmental standards, policy formation is altered, as policymakers would theoretically shape policy in order to meet these new standards. Furthermore, experiential envnrionmental education would have a profound influence on policy evaluation. Experiential environmental education, which teaches students to use divergent thinking, would allow the public to view a policy from multiple disciplines and standpoints. This would improve the quality of policy assessment, as well as the discussion of potential improvements and solutions. Thus, environmental education would help expand the discussion of possible effective policies while also setting a new standard for the initial quality of policies enacted by policymakers.

Conclusion: Further Improvements and The Need for Alternatives.

In today's political arena politicians are generally unsympathetic to environmental issues. It is therefore questionable whether or not public outcry will successfully influence their policies to be more sustainable. In fact, it is not uncommon for environmental educators to be labeled as liberal radicals. As Fletcher Brown explains in "The Nowhere Land Of The Environmental Educator," the intentions of environmental educators are often questioned. As Brown explains, "one of the major concerns . . . about environmental education over the years involves the perception that students are given biased information that may lead to their becoming environmental activists" (Brown). In other words, environmental educators are often accused of misinforming students in order to manipulate their thoughts. With this attitude dominating the current political arena, the question of whether or not rigorous education reform is enough to bring change remains unanswered. Therefore, it is vital that additional methods of education reform be pursued and alternative solutions to environmental degradation be discussed, and compared.

Further research into the effects of current environmental education programs must be done in order to evaluate what additional methods of reform as necessary to improve environmental pedagogy in America. For example, New York State's Department of Environmental Conservation hosts several camps and programs devoted to encouraging informal experiential learning.[71] Other environmental institutions that are also attempting to improve environmental education are the Environmental Literacy Council and the Campaign for Environmental Literacy. Respectively, these two organizations hope to improve the

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[71] "Education." *New York State Department of Environmental Conservation*.

quality of ecological studies[72] and increase the funding and federal support of environmental education programs.[73] Additional institutions such as The National Environmental Education Foundation[74] and NYU Wallerstein Collaborative For Urban Environmental Education[75] also advocate for increasing the use of environmental education both inside and outside of the classroom. The prevalence of these organizations, and others like them, demonstrate the current strive to improve environmental education. Therefore, it is important to further research and analyze the effects of these initiatives in order to tailor future reforms to coincide with their successes and improve their failures.

Education reform is, in theory, the most straightforward method of improving environmental protection for two main reasons. Firstly, we learn as we live and we live by what we have learned. Therefore, to learn about environmental sustainability is to live sustainably. Secondly, the governed are meant to use elections to control those doing the governing. If the public makes a demand, it should be in a politician's best interest to meet it. Thus, shaping eco-literacy and inspiring the public to function as environmental citizens should result in influencing our leaders to value environmental protection. While further research is necessary in order to develop the most effective methods of educating, there is undeniable promise in improving environmental protection through education.

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[72] "About Us." *Environmental Literacy Council*.

[73] "About the Campaign for Environmental Literacy." *Campaign For Environmental Literacy.*

[74] "Knowledge To Live By." *National Environmental Education Foundation: Knowledge To Live By*

[75] "Wallerstein Collaborative For Urban Environmental Education Department of Teaching and Learning: Celebrating Our 10th Anniversary." *Wallerstein Collaborative – NYU Steinhardt*.

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