

Ecological Education: Pedagogy of Awareness, Transformation and Action through Children's
Literature in an ESL classroom

by

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A thesis submitted in partial fulfillment of the requirements for the degree of

MASTER OF ARTS
In
ENGLISH EDUCATION

UNIVERSITY OF PUERTO RICO
MAYAGÜEZ CAMPUS
May 2015

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Abstract

This research investigation explores possible ways of formally introducing ecological education to sixth grade Puerto Rican learners through children and young adult literature. The purpose of this project is to explore the contemporary ecological crisis while creating awareness and transformation for future learners in order to prevent and reverse ecological collapse. This is done through content based learning by applying Dewey's hands-on pedagogy, Freire's critical thinking pedagogy and Grossberg's popular culture pedagogy to the fairytale Little Red Cap, the modern fable The Lorax and the Japanese comic Nausicaa of the Valley of the Wind. These texts are analyzed in depth by using ecological literacy, literary ecology, and ecological criticism to acquire a better understanding of how popular culture portrays nature and scientific information students can learn from the texts as well as how an academic community is built upon knowledge. Moreover, this project provides teachers a model of how the topic of ecology is integrated into the current Puerto Rican ESL curriculum through lesson plans—on human ecology and ecology—based on each literary text analyzed to promote transformative learning experiences and actions.

Resumen

Esta investigación explora posibles métodos para incorporar la educación ecológica al aprendizaje de sexto grado mediante literatura infantil y juvenil. El propósito de este proyecto es explorar la crisis ecológica contemporánea al mismo tiempo que se concientia a los aprendices de tal forma, que puedan prevenir y revertir el colapso ecológico. Esto lo logramos mediante la aplicación de las actitudes manuales según la pedagogía de Dewey, la de análisis crítico de Freire y la de cultura de Grossberg al cuento de hadas “Little Red Cap”, la fabula moderna “The Lorax” y el comic japonés “Nausicaa of the Valley of the Wind”. Estos textos se analizan profundamente, usando habilidades de lectoescritura ecológica, “literary ecology” y criticismo ecológico para tener un mejor entendimiento acerca de cómo la cultura popular representa la naturaleza, la información científica que los alumnos pueden adquirir de los textos así como se construye la comunidad académica en torno a ese conocimiento. Además, este estudio facilita a los educadores un modelo sobre como pueden intregar el tema ecológico al currículo actual de inglés como segundo idioma (ESL) en Puerto Rico mediante planificación—en ecología humana y ecología—basada en cada texto literario analizado para promover experiencias de aprendizaje transformativo y de acción.

Acknowledgements

I would like to thank Dr. Rosa Román for providing me with words and guidance on my thesis as well as my personal life. She has been both my professor and my good friend, and has allowed me to view life from a different perspective. I would to thank you for your time, knowledge and effort. You are a crucial part of the English and Educational programs, do not let yourself think otherwise.

I would also like to thank Dr. José Irizarry for listening to my many ideas and giving me the guidance through the conception and development of this thesis project. You have nurtured and picked my brain throughout many years of my academic career, and have gifted me with perhaps a few literary genres which have changed my outlook on life: Transcendentalist, Naturalist and American Romanticism. I would also like to thank you for listening to my complaints and giving me the focus to continue this project.

I would also like to thank Dr. Rebeca Orama for taking a chance with my thesis project and giving me insightful feedback to make my thesis project happen. It has also been my pleasure to have met someone so knowledgeable and wise. I look forward to sharing more ideas with you.

I would also like to thank Rebecca Carrero for translating the abstract, being part of my thesis defense and providing helpful feedback so that project could reach its culmination.

I would like to thank my family and friends Arleen, Franchesca, Rene, Yamil and Luis for encouraging me to continue this project. Finally, I would like to thank my dog, Juno, who has loved me unconditionally and offered cuddles after tough days. Without your support and reassurance, I would not have been able to make it.

Dedication

I would like to dedicate this research project to future English educators who strive to find possible ways to incorporate significant topics to their classes. Even though, your job may seem daunting at times, truly believe your efforts will influence the lives of those around us.

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List of Abbreviations

ESL	English as a Second Language
DEPR	Department of Education of Puerto Rico
YA	Young Adult
CBI	Content-based instruction

List of Terms

Archaea
Bacteria
Banking Education
Codification
Concientização
Constructivism
Content-Based Instruction
Decodification
Dialogue
Ecology
Environmentalism
Environments
Fable
Family
Genus
Green
High Culture
Human Ecology
Manga
Popular Culture
Praxis
Reconstructivist
Transcendence

Chapter 1: Introduction and Justification

The earth does not belong to the man, man belongs to the earth. All things are connected like the blood that unites us all. Man did not weave the web of life, he is merely a strand in it.

—Chief Seattle Letter

Day by day we are immersed in maintaining our lives; working, educating ourselves and taking care of the events that impact us directly. We tend to go on with our lives worrying about the costs of utility—gas, electricity, water and telephone services—or if weather changes will prohibit one from accomplishing work; rarely, does one think of nature and its role in each individual's life. People seem to dismiss how nature is all around us, how it has shaped our lives or even how much as individuals we depend on it to survive. As White (1996) states, “what people do about their ecology depends on what they think about themselves in relation to things around them” (p. 9). Modern society looks at nature as a commodity using planet Earth's natural resources as we please, and because of greed, unawareness and misinformation, humankind is now facing an ecological crisis.

The topic of the environment and our connection to it has stirred the minds of many; it has created social movements, made an impact on academia as well as forced the government to take action and study the consequences of our way of living or our footprint on this Earth. However, it wasn't until the beginning of the 21st century when environmental and ecological issues have taken center stage as a major contemporary global problem society faces. Under the plausible threat of species extinction due to global warming, educating contemporary and future generations about such topics should become one of the major priorities and objectives of education. At present, our students, children, teens and young adults are constantly being bombarded with seemingly disparate topics such as global warming, and climate change, but

very few actually understand the ecological crisis holistically, especially since the media and popular culture have made “going green” the latest trend or fad. This representation via trendiness further complicates understanding and student's attention because it promotes desensitization wherefore very few people care to comprehend the significance and deeper importance of environmental or ecological topics. However, this trivialization should not be blamed completely on the media but rather on collective entities—such as public education—which tends to belittle the significance and consequences behind concepts like going green, global warming, climate change, sustainability and others. This trivialization has led to a desensitization and misinformation, redirecting educational information, from which children and teenagers have been unable to obtain information that both allow learners to grow as individuals and enables them to change their behavior, lifestyle and view of life and be aware and benefit their government environmental footprint.

This thesis postulates that it is vital for people to understand the difference between nature and Nature. On one hand, when one refers to nature, without the capital n, it is to talk about a locationⁱ or placeⁱⁱ which is of importance for oneself or characters. Meaning all life forms, from the smallest such as bacteriaⁱⁱⁱ, archaeans^{iv}, eukaryotes^v, to what most people recognize as life such as plants, animals and humans. Therefore, this concept encompasses all there is to biological life^{vi}, from living organisms to that which we consider to be lifeless but contributes to the cycle of life. On the other hand, one refers to Nature, with a capital n, when one is taking into account the academic discourse about nature itself. This academic discourse on nature could be on different academic subjects like hard sciences like biology, physics, geology, astrology and chemistry as well as education, history, arts and philosophy.

Some of the most important discourse on nature in American literature and philosophy were part of a socio-cultural and academic revolution which took place in the 19th century. Two of the literary movements were Transcendentalism, an intellectual literary movement which created its own philosophy emphasizing the connection between man, nature and the spiritual, which also focused on the search of truth through nature and the intellect. And later in the century, American Realism, an art, music and literary movement which focuses on the contemporary social realities and the day to day activities of ordinary people. Although this movement also focuses on the importance of people and the stories' purpose or message rather than the plot, an artistic offshoot was Naturalism, which continued to the second decade of the 20th century. Naturalism, unlike the previous movements, is a philosophical position which made its way to literature by attempting to apply scientific objectivity to human beings and the circumstances in which they live.

Intellectuals like Ralph Waldo Emerson ^{vii}, Henry David Thoreau ^{viii}, Mark Twain ^{ix}, Jack London ^x and John Muir ^{xi}, to name a few, became the grant voices of ecological awareness movements in America through Regionalism. They have and continue to influence contemporary society and the way in which humankind acts and looks at the world for more than two centuries. Their works, words and philosophy spreading from intellectual communities to everyday life and popular culture, give way to multiple environmental movements in America. One of the most recent and popular environmentally aware movements, or rather counter cultures of mainstream society, in today's popular culture happened during the 1960's where environmental efforts, local farming and sustainability started to become part of everyday alternate lifestyles, ultimately surfacing again in popular culture through the green movement in recent years.

Recently, the Puerto Rican newspaper *El Nuevo Dia*^{xii} published how the Puerto Rican government has left the Natural Reserve Cerro Las Planadas unprotected, including its flora and fauna, as is stipulated by Puerto Rican Natural Patrimony—Act No. 150 of August 4, 1998— (9 Nov. 2013), how the governor is trying to revive Puerto Rican agricultural tradition and legacy for future generations (2 Oct. 2013) and how a 10-year-old agriculturalist dreams of creating an agricultural school for his classmates in his hometown (29 Sep. 2013). It seems ecological topics, or ones which are close to nature, are present in today's Puerto Rican culture but they are somehow oversimplified or overlooked since people believe anything involving nature is only of interest or could only be solved by agronomist, biologist or environmentalist. But this is happening globally so much so that David Orr states in *Earth in Mind*, "The ecological crisis is in every way a crisis of education... education has to do with timeless questions of how we are to live". That is to say, it is the duty of formal education to provide students with the necessary knowledge and skills to overcome the circumstances or obstacles of their times.

The notion of educating learners formally about traditions, problems, ambitions and sociopolitical influences that affect our culture is only logical since it is one of the ways of enriching the minds of the learners, their families and their communities at a larger scale. The Department of Education of Puerto Rico's (DEPR) Curriculum Renovation Project document (2003) states,

The trend that schools respond to social demands is specially accentuated in modern times where the nature of production and work require the development of certain capabilities or competencies, that is, knowledge, skills, and attitudes which only formal education is capable of delivering (Proyecto de Renovación Curricular, 25, trans. Rosa Roman)^{xiii}.

However, we also have to become aware that every era that in marks society, there will also come complications with it more so when societal system is to break away from traditions and start anew.

On March 2010, the U. S Department of Education published *A Blueprint for Reform: The Reauthorization of the Elementary and Secondary Education Act*, in which the President of the United States, Barack Obama, expressed how

Today, more than ever, a world-class education is a prerequisite for success. America was once the best educated nation in the world. A generation ago, we led all nations in college completion, but today, 10 countries have passed us. It is not that their students are smarter than ours. It is that these countries are being smarter about how to educate their students.

(n.p.)

This is important because Barack Obama and the U.S Department of Education openly acknowledge the fact that to receive *A Complete Education* means “learning all content areas—from literacy to science” (p. 29), including environmental education.

The *Blueprint for Reform* focuses on how the current educational system needs to be rehabilitated in order to suffice the needs of the contemporary learner, culture and time period; the changes need to achieve a more holistic and career driven education as well as monitor the efforts and resources needed to make the changes possible. Nevertheless, the area which is of most relevance to us is *A Complete Education* because of its ecological contribution not only to the United States, but also Puerto Rico. Consequently, we have to take a particular look at the public educational system in Puerto Rico, so we can later determine how students are able to make connections between the information provided to them at schools and their daily lives, specially skills, knowledge, actions—such as ecological topics—which could help improve the

life of the individual, both at a philosophical and emotional level as well as at an intellectual level.

By 2010 ecological and environmental topics had become so relevant to contemporary society and culture that the Puerto Rico Department of Education established them as topics to be integrated in the curriculum of all grade levels within its system. This situation in particular offers a great variety of literary choices for language teachers and is possible because it is approached as a second language, meaning it is decentralized and therefore focuses on the learner's needs and their intellectual growth. The Curricular Framework states,

In addition to its flexibility, the English Program is further characterized by an interdisciplinary approach where learning English as a second language is integrated with the learning of other subjects. To this effect, cooperation and collaboration among teachers of different subjects is emphasized in order to put this integrative approach to teaching and learning into practice. Second language acquisition research and methodology both in the United States and Puerto Rico support a decentralized, teacher-generated and learner-centered curriculum where the student is genuinely interested in learning and growing intellectually. (2003, p. 19)

More importantly, teaching and learning ecological topics is one of the many ways of establishing a universal education for all learners that can both satisfy the standards of the DEPR as well as being flexible and reasonable enough so all individuals can receive the same educational foundation.

I once read that "Education is for everyone, but the way in which we deliver education—and the way in which students receive it—is not the same for everyone" (*Educational Learning, 2013*). This is especially true for students in Puerto Rico because: "although the teaching and

learning of English has been a priority in terms of allocated funds and policy made over the past 100 years, various studies have shown that the results of these efforts have not been encouraging and are rather limited” (2003, p. 8). One of the reasons for this is the strong political connection that exists between the language and the country's history. Some consider this connection to be a “major threat to the very core of Puerto Rico's cultural and linguistic identity” (2003, p. 6). However, another reason is the lack of relevancy in the manner the educational system has taken to teach the English language which is at fault and fails to teach ecological issues in a holistic approach.

The failure to teach the English language in the island of Puerto Rico in a relevant manner has not been for the lack of effort or the capability of English, teachers but rather because of collective blunders on making connections between what is being taught and how learners could apply this information later on in their daily lives. As expressed in the Curriculum Framework for the English program, “the first step in obtaining better results in the teaching and learning of English in Puerto Rico would be to ‘liberate’ second language teaching and learning from the paralyzing effects of politics and to clarify its goals in a more realistic and less threatening way” (2003, p. 9). This situation is true for every grade level, thus educators are now actively trying to integrate topics like technology, education for peace and environmentalism, into their lessons but the learners do not have enough exposure to the topic to actually develop extensive vocabulary and life-long knowledge.

Consequently, the aim of this study is to look closely and propose new approaches that can be applied to the public educational system in Puerto Rico in order to combine the acquisition of a second language, ecological topics in the context of the social and cultural

realities of the Puerto Rican population to improve the students/ learner's educational experience while creating awareness of relevant ecological topics.

Some of the reasons for teaching ecological topics in the English classroom are: 1) to counter what the public educational system (DEPR) has conceptualized and taught students about Nature, Agriculture and Sustainability from a domesticated perspective, which it has promoted and taught in a decentralized manner. By this, I mean every aspect of nature is seen as an object that must be managed, controlled or used by mankind in order to be considered useful, from the handling of natural resources to the domestication of flora and fauna for mankind's own benefit. This current approach is making it difficult for students to see nature as anything else than a lifeless object to exploit; 2) To accustom students with eco-theory and criticism, and also basic knowledge, about Nature and how to apply this knowledge to their lives and 3) To create consciousness of the prejudice behind ecological topics and instill agency to actively transform the portrayal of nature.

The inclusion of ecological issues in the educational system can be difficult to accomplish for any teacher, not because of the implications of the topic, but because people seem to forget acting upon said words is a political and technological act. As William Rueckert (1996) states,

Bringing literature and ecology together is a lesson of the harshest, cruelest realities which permeate our profession: we live by the word, and by the power of the real word, but are increasingly powerless to act upon the word. Real power in our time is political, economic, and technological; real knowledge is increasingly scientific. (p. 115)

An in-depth look at these tales and books from an ecological perspective, will allow students to see the different ecosystems present in them. From these readings students can understand the

construction of the relationship humans have towards nature, the role humans, other animals and plants occupy in specific environments and the change in attitude characters express towards nature at different points in the text. As Dickinson (2010) states in *Inspiring Awareness: Using Life Writing in Ecological Education*, "Literature can thus do what science and policy cannot; it can inspire a cultural change that can affect many readers and create the beginnings of a more responsive society" (Simms, 2011, p. 15). Therefore, by integrating literature as a medium for the teaching of ecological topics, the English teacher will be able to focus on the philosophical and ethical topics the text reveal and discuss certain societal anthropocentric tendencies while enhancing their vocabulary and motivation.

The next chapter presents a literature review which will focus on the pedagogies relevant to this thesis project. It also discusses the components used to analyze the selected texts from an ecological perspective.

Chapter 2: Review of Literature

The idea is not to reduce the human mind to a moronic vacuity, but to bring into play its innate and spontaneous intelligence by using it without forcing it.

- Alan W. Watts
(The Way of Zen, 1958, 21)

This chapter takes a closer look at what experts of different academic fields have to say about nature, philosophy, literature and education in pedagogy and awareness of the current ecological crisis. It will also explore concepts and components such as ecological literature, ecological criticism and literary ecology in-depth and the implementation of three different pedagogies; 1) Dewey's constructivism, 2) Freire's critical thinking and 3) Grossberg's popular culture pedagogy with the purpose of explaining the contemporary ecological crisis and how this dilemma can be addressed in the classroom from an academic level at an early age in order to create awareness and transformation in today's academic and popular culture.

Dewey's Constructivism and 21st Century Education

Dewey advocated schools were meant to be social places where children encountered situations which would stimulate them intellectually and creatively. The result of these words revolutionized two aspects of education. First, being children were treated as intellectually capable and creative individuals who were being negated of a voice, knowledge and experiences through subject matter education only. As Dewey (1916) articulates, "Give the pupils something to do, not something to learn; and the doing is of such a nature as to demand thinking; learning naturally results" (p. 148). Therefore, children are being presented with enriching experiences as well as being provided the opportunity, motivation and time to breach objective information with the experience itself.

Second, schools needed to be dynamic places where learners could broaden their experiences of the world. As Dewey (1902) notes,

The child lives in a somewhat narrow world of personal contacts. Things hardly come within his experience unless they touch, intimately and obviously, his wellbeing, or that of his family or friends. His world is a world of personal interest, rather than a realm of facts and laws. (p. 22)

Learners acquire knowledge actively and naturally when they can relate their personal experiences with what is being taught in formal education. By doing so Dewey restructured the role of the teacher as well as the roles student; education was no longer a one way street but a safe medium to interchange information and interests.

Although, Dewey's method has proven to be effective, the practice of subject matter education only has proven difficult to eradicate. In fact, the 21st century educational system still faces the same problems Dewey warned us about: systematized education that treats children as part of a machine which produces future citizens to perpetuate a culture and its community. Interestingly enough, education has become, for the most part, what we strive for—an enduring journey which delivers us closer to our purpose within society. Individuals receive formal education for countless years, only to study some more during the individual's life; but the truth of the matter is, as humans, we never stop learning. While, the idea of educating learners, formally about the multiple aspects that affect our culture is coherent, the logical-structure based approaches contemporary education practices seem to disregard the fact that children see the world as a whole, not in subject-matter categories.

By integrating Dewey's constructivism into 21st century education, educators would be able to engage students through different first hand experiences while presenting them with

materials that are both relevant as well as dynamic and attractive to the learner, such as popular literature. As Short (2011) states, "Literature expands children's life spaces through inquiries that take them outside the boundaries of their lives to other places, times and ways of living" (p. 50).

Furthermore,

children's literature, in the form of storybooks, mythic tales, and image-based and/or written texts, can be deeply pleasurable as well as troubling, on aesthetics and ecopolitical as well as effective. Such literature can afford opening for dialogue both with and against dominant culture texts, images, narratives and figurations of eco-cultural relations, and may offer incompatible as well as compelling understandings of childhood, adulthood, places and nature. It may also encourage a "comparing and contrasting" of these alongside questions of the ecologies and cultures depicted in children's literature, including children's and adult's conceptions and constructions of environment that might be experienced with or through them, their senses of an eco-identity, -citizenship or – responsibility related to such places and nature. (Cutter-Mackenzie, 1996, p. 2)

Consequently, by teaching children Ecology through literature, learners are able to broaden their interests, explore different topics such as ecology and create consciousness towards their place in society, popular culture and education. The main aspect, which the 21st century formal education has neglected, is being able to make learning pleasurable in addition to informative and challenging.

Freire's Critical Thinking Pedagogy and Content-Based Instruction

The crucial aspect of integrating formal education with Dewey's constructivism is presenting the information in such a way children feel motivated to learn; learners will no longer be treated as empty vessels which need to be filled with knowledge (banking system)^{xv}, but

rather as citizens who come into the classroom with enriching experiences and voices. As Freire (2005) explains in *Pedagogy of the Oppressed*,

Education either functions as an instrument which is used to facilitate integration of the younger generation into the logic of the present system and bring about conformity or it becomes the practice of freedom, the means by which men and women deal critically and creatively with reality and discover how to participate in the transformation of their world. (p. 34)

However, in order to motivate children to partake or enjoy formal education, one must first foster the learner's critical skills, nourish their voices and encourage learners to think of themselves agents of change.

Both Dewey and Freire, have made clear as to the importance of humanity's relationship to the world in order to understand it, and how, in turn, the world is transformed by their thoughts (critical thinking), actions (praxis)^{xvi} and their environment. However, it is also important to understand there are various layers to these relationships, meaning the biological and the cultural aspects of life, rather than a simple reality.

The normal role of human beings in and with the world is not a passive one. Because they are not limited to the natural (biological) sphere but participate in the creative dimension as well, men can intervene in reality in order to change it. Inheriting acquired experience, creating and re-creating, integrating themselves into their context, responding to its challenges, objectifying themselves, discerning, transcending, men enter into the domain which is theirs exclusively-that of History and of Culture. (Freire, 2007, p. 4)

Subsequently, as people relate to and with the world, they begin transforming it; reality is seen as dynamic and generative, thus, becomes humanized (Freire, Education, 4). In order to understand

this phenomenon known as culture, humans begin to study it, through the means of formal education, hoping to understand their epoch.

Supposedly, through formal education humans learn to think critically of their actions, however,

If men are unable to perceive critically the themes of their time, and thus to intervene actively in reality, they are carried along in the wake of change. They see that the times are changing, but they are submerged in that change and so cannot discern its dramatic significance. (Freire, 2007 p. 6)

As a result, a sense of hopelessness is created and propagated through the population; thus, they are unable to see how their experience of reality can change, giving authority to others and narrowing their own. That is until, a new group of individuals “integrate themselves with their reality” (Freire, 2007, p. 10), by grasping the themes as tasks of their time; hence, critical optimism is born and, in turn, a transitional period begins. More importantly, society must be able to recognize if this change, in and of culture, is a form of manipulation or an authentic event of collective awareness.

As Freire points out, “conscientização represents the development of the awakening of critical awareness. It will not appear as a natural byproduct of even major economic changes, but must grow out of a critical educational effort based on favorable historical conditions” (2007, p. 15). This means education will be the medium, which helps humans be emotionally, philosophically and psychologically ready for transition; a period of time where that will give birth to new way of thinking and approaching situations. “The special contribution of the educator to the birth of the new society would have to be a critical educator which could help to form critical attitudes” (Freire, 2007, p. 29), through means of literacy, thus literature.

It is important to understand literacy is not being able to dominate skill like reading and writing, but being aware one is participating in open discussions (dialogue) ^{xvii} through symbolic means. Similarly, to Dewey's stance on the role of the educator, Freire notes how the role of the educator would be to discuss with the learner in order to provide them with concrete situations and instruments, which enable the learner to teach himself how to read or write (2007, p. 43).

This teaching cannot be done from the top down, but only from the inside out...with the collaboration of the educator. That is why we searched for a method which would be the instrument of the learner as well as of the educator, and which, ...would identify learning *content* with the learning *process*. (Freire, 2007, p. 43)

This bottom-up approach Freire talks about is known as the Content-Based Instruction, a communicative approach, which focuses on students learning to communicate through communication, rather than language drills often used in 21st century education.

However, what makes Content-Based Instruction (CBI) special is that "it is not exclusively a language program, but instead integrates the learning of a language with the learning of other content" (Larsen-Freeman, 2011, p. 132). The content can be themes, topics or artifacts of popular culture; in this case, the content will be ecology through children's literature. As Short (2011) states,

If literature is the imaginative shaping of experience and thought into the forms and structures of language; children are the readers who reshape the experience and use literary language to name and transform life. Living inside the world of a story may enable them to engage in inquiry that transforms their thinking about their lives and world. (p. 50)

The use of literature will help develop the learner from social repression, but will also expand

their capabilities, through the eyes of the characters. Learners will be able to extract, analyze and adapt these occurrences to his/her reality, hence, engaging in transformation for themselves. If this effort is then duplicated, transformation will transcend that of the individual and will affect that of the collective, resulting in an active society and a transformative culture.

Ecology and Popular Culture

Efforts like the one made by Freire—his socio-political, educational and philosophical practices—are product of an academic field called cultural studies. This is an “interdisciplinary, transdisciplinary, and sometimes counter-disciplinary field that operates in the tension between its tendencies to embrace both a broad, anthropological and more a narrowly humanistic conception of culture” (Grossberg & Nelson, 1991, p. 4). More importantly, cultural studies “challenges the boundaries between the academy and the outside world” (Grossberg, 1997, p. 22), by taking an in-depth look at aspects in everyday life and explaining the social practices or artifacts through methodologies, thus, defining what culture is, what encompasses it and how it affects the individual as well as society. In other words, cultural studies is an academic field that specializes in exploring and scrutinizing social practices and artifacts that have shaped society, thus culture, as we know it.

Likewise, the notion of culture is “a general reaction to a general and major change in the condition of our common life” (1991, p. 4), or as Lawrence Grossberg (1997) states, “culture is that which mediates between people and reality, turning chaos into order” (1997, p. 5). In other words, culture is an umbrella term that focuses on emphasizing the multiple ways in which humankind codes^{xviii} and decodes^{xix} information considered to be significant to the development of a community. Hence,

Culture is understood both as a way of life—encouraging ideas, attitudes, languages, practices, institutions, and structures of power—and a whole range of cultural practices: artistic forms, texts, canons, architecture, mass-produced commodities, and so forth.

(1991, p. 5)

Consequently, culture is developed and established by summarizing and exalting certain events, glorifying specific people, their ideals, values and traditions that have shaped the way in which humankind lives, how individuals interact with others and their way of life.

Culture could also be defined by geographical place, meaning that each topographical area is the result of its own values, beliefs, traditions and philosophy of life. “Therefore, all cultural practices involve the production of meanings and representations...and all cultural practices are treated as instances of the communicational relationship between text and audience” (Grossberg, 1997, p. 5). This is done through social and political imparted behaviors and ideals taught through formal and informal education as well as environmental and financial upbringing. This is rather important because,

...if culture is not simply a matter of meaning and communication, then the struggle over “culture” is a struggle over the behavior of the population, especially the different and differently subordinate fractions (which in the contemporary world includes the vast majority of the population), and the role of discursive practices in constructing the machinery by which such behavior is controlled. (Grossberg, 1997, p. 7)

That is to say, culture makes and defines our thoughts, actions and identities, which in turn, are reflected in the way we develop society, as well as, the way we view and act upon the natural world.

Nevertheless, the geographical definition of culture could be rather difficult to visualize in the 21st century since there are only a few communities that are exempt from multiculturalism, unless they decide to exclude themselves from contemporary society; especially since we live in a very technological friendly time period. Tools found on the Internet like file sharing, e-books, Twitter, Tumblr, Facebook, Vine, Google Plus and others, have become the primary mode of communication for people around the world. As Nealon and Giroux (2003) point out, "culture influences subjects as much as subjects influence culture" (p. 53). With the click of a button we can select groups of individuals we would like to exchange information with or separate ourselves from. These actions and tools, however, oversimplify the manner in which people relate to each other and how we relate to the physical world. As Rueckert (1996) says, there is no population, community, or ecosystem left on earth completely independent of the affects of human cultural behavior. Now [this human] influence has begun to spread beyond the globe to the rest of our planetary system and even the universe itself (p. 114).

Because most people see culture as a reflection of their interactions, there has been a rupture in what people believe culture to be, especially within art forms. Subsequently, we are left with *high culture*, which focuses on "values that are not tied down by time, place or set of cultural values" (Nealon, 2003, p. 66), and *popular culture*, which teaches us how to feel sad, what is fun, what we should be excited by and what should bore us (Nealon, 2003, p. 68). How and what we categorize under these two forms of culture are mostly divided by the social and educational status of an individual. Thus, some individuals are lead to believe that popular culture cannot and will not teach learners anything of intellectual worth.

In spite of Nealon's simple definition of popular culture, Lawrence Grossberg (1997) describes it as "a subset of the larger category of cultural practices.... It [sic] is one of the sites

where this struggle for and against a culture of the powerful is engaged: it is also the stake to be won or lost in a struggle” (p. 7). Meaning popular culture is not only what teaches us how to feel about a certain subject, as Neelson (2003) suggests, but also a culture that changes and shapes itself, making note of everything of interest or relevant to a particular community, simultaneously to and with society. Above all, Grossberg expresses how the point of popular discourse “is not about culture but about the struggles to articulate the relations between the social and economic power, political terms of agency, and modes of discourse practices (1997, p. 7). Therefore, it could be said popular culture is that which we encounter on a daily basis, aimed to and a reflection of the taste and satisfaction of the general masses of people.

Consequently, Grossberg (1991) suggests popular culture is a “powerful source of education and socialization, and one of the primary ways in which people make sense of themselves, their lives and the world” (p. 69). This has been especially true for the 21st century society, where the role of ecologically intellectual individuals are placed in the hands of elite scientist, academics and politicians such as Al Gore, who with the help of the documentary *The Inconvenient Truth* (2006), popularized terms like climate change. Said documentary created environmental awareness for the masses and became a cultural phenomenon, making its way to popular culture and undoubtedly being part of a new trend where topics related to environmentalism and ecological awareness were fashionable.

Popular culture, operating with an affective sensibility, is a crucial ground where people give others, whether cultural practices or social groups, the authority to shape their identity and locate them within various circuits of power...by making certain things matter, people “authorize” them to speak for them, not only as a spoke person but as a surrogate voice. (Grossberg, 1992, p. 83)

As a result, mainstream culture became a medium for ecological topics through movies like *Avatar*, *Wall-E* and *Happy Feet*, among others, which focus on the implications of exploiting natural resources of the flora and fauna of a planet, how present waste management damages ecosystems and how climate change has affected places like Antarctica and its wildlife, thus, damaging planet Earth as a whole.

Mainstream popular culture has also become enthralled with ecological non-fiction television channels and programs like *Planet Earth*, which shows the wide wildlife diversity on planet Earth and its significance, as well as encouraged fictional mainstream programs like *The Simpsons* and *Spongebob Squarepants*, to make episodes on ecological awareness. Still, we must not forget literature has also made its way to popular culture with books like the *Harry Potter* series and traditional literature such as fables and fairy tales. All have in common nature as an important aspect of character growth which provide the stories with dynamic settings and underline the relationship between humans and their environments. Needless to say, ecological topics in literature are not only present in popular contemporary children's and young adult literature, but have been present for centuries as part of literary movements like Transcendentalism, Naturalism, Romanticism, and the most recent, the Post-natural movement.

The name Post-natural literally means after nature, referring to the alienation contemporary society has towards the natural world and the implications of it, including mankind's infatuation to create or engineer organisms. This literary movement's fundamental interests are human culture, politics, economics as it is manifested through living organisms, hence, focuses on looking at human culture through the lens of biology. As Deitering (1996) suggests in *The Post-natural Novel*,

Fiction in the 80's, in its sustained and various representations of pollution, offers an insight into a culture's shifting relationship to nature and to the environment at the time when the immense ecological collapse was, and is, part of the public mind and of the individual's imagination....they mirror a shift in cultural identity--a shift for the culture defined by its production to a culture defined by its waste. (p. 196)

As a result, its goal is to examine what people do to living beings (biotic) and non-living (abiotic) objects on purpose from a scientific stance. This is important because it has influenced future works, either directly or indirectly and has focused on ecological and environmental themes during the 1980's encouraging authors like Hayao Miyazaki to voice their thoughts on the matter through literature, such as mangas.

Mangas as a Medium of Instruction

Comics tend to be avoided by educators because they are looked as a childish and limited in terms of topic range, however, this is a matter of perspective. As Brenner (2011) expresses in "Comics and Graphic Novels",

Manga is an accepted part of everyday entertainment in Japan, similar to the ubiquity of television here in the United States, and everyone from the businessmen to senior citizens to students indulge in their weekly manga fix. Unlike the U.S market, Japanese manga were and continue to be written on any topic, from sport comedies to romance to nonfiction guides to the workplace, and no one genre (like superheroes) dominates the market. (p. 262)

This is rather significant since it is a way of breaking the stereotyped prejudice behind comics aside from providing the students with literature that is intellectually and visually provoking.

The use of images help the reader become more engrossed with the story, thus, allows the reader to have a clearer way of grasping the story.

Graphic novels are constructed so that they text cannot make sense without the images and vice versa, so it is vital to process an image In the images are the descriptions, asides, background information that found in traditional prose, and skimming over them leaves the readers with the impression of a lack of detail, character development, or world-building (Brenner, 2011, p. 258).

Since we live in a visual society and culture, these images could help the reader be more aware of details that would most likely be ignored or overlooked in traditional literature. In addition, Manga tend to have a complex chronological time period and are not episodic, meaning manga tend to have a plot that expands through the duration of the comic book or series, while western comics tend to have a plot for each chapter.

Cultural practices like the ones presented above have given way for more social, political and philosophical conversations among the general population about the current ecological crisis which the 21st century faces. Likewise, literary movements like this one have opened doors for a wide set of people to not only ponder upon ecological topics, but also to expand the knowledge and curiosity of the people who in counter to it. More importantly, this wide variety of popular culture artifacts have shown that it (popular culture) has done what formal education has failed to do; finding new ways of providing information on ecological topics in a humorous, exciting and attractive manner.

Reconstructivism and Ecological Education

The main concern of ecological education is not only the acquisition of ecological knowledge but rather the opportunity for people to experience and comprehend ecology first

hand so it can be translated into social change. As Grossberg (1992) notes, "popular culture is more than ideological: it provides the sites of relaxation, privacy, pleasure, enjoyment, feeling good, fun and passion" (p. 79). Therefore,

through practices of critical literacy, which encourages analyses and questioning of oppression and all forms of domination, readers are challenged to critique and question "what is" and "who benefits" as well as hope and consider "what if". Through critical literacy, children learn to problem-pose and question the everyday world, to interrogate relationships between language and power, to analyze the images and messages conveyed through popular culture and media, to understand how and why power relationships are socially constructed and maintained, and to consider actions that promote social justice. (Short, 2011, p. 52)

Critical Literacy, through Content-Based Instruction^{xx}, will provide learners with a space to voice their opinions, question their values, beliefs and events that have happened in their lives as well as the lives of those they encounter. It will also provide learners the confidence to use their lives and experiences as tools for social and cultural change (Short, 2011, p. 52). Consequently, the enigma contemporary society and the 21st century education is faced with is the absence of a bridge between formal education (high culture) and popular culture. "One cannot expect positive results from an educational or political action program which fails to respect the particular view of the world held by the people. Such a program constitutes cultural invasion, good intentions notwithstanding" (Freire, 2005, p. 95).

There has been very little demand in terms of building an academic community that focuses on the importance of ecological issues present in the text or its influence on contemporary culture, although that is changing, therefore, it is our duty as educators to present

new possibilities to learners. Since environmentalism and ecology are being explored and looked at closely during the last twenty years, this field has gained some attention, nevertheless, the majority of communities who address ecological topics tend to focus on nature as symbols or metaphors within the field of children's literature. In fact, it is because of this that teaching ecological issues through literature, especially fairy tales, fables or comics, is such a good idea since the teacher has new material and techniques to touch upon ecological topics and so the students can get new perspectives on popular literature.

For instance, Fairy Tales like Little Red Cap are a way of introducing ecological issues to children since the majority of the learners are already familiar with the material provided so they can focus on nature and how it has affected their view of nature. This is particularly true for children who have come to age during the Disney Generation or Disney Culture flourish, who have constantly been fed classic childhood movies like *Sleeping Beauty* and *Beauty and the Beast*, which portray nature or rather wilderness as savage, wicked and something to be feared, since they are more likely to have a negative view of nature. The reason for this is that individuals, consciously or unconsciously, tend to be much more afraid and even traumatized by some of the images or books that portray nature as a killer.

Although, one cannot claim that reading a particular story has shaped the way we encounter nature, one can argue that multiple encounters with books which portray nature negatively, as well as limited exposure to nature, can convince an individual of. Dobrin (2011) states

Children's literature has been identified as instructional or, more specifically, as acculturating, initiating children into the adult world by providing them with guidelines, values, and expectations about the adult world. Children's texts, even those considered to

be fantasy or imaginary, were considered to be preparatory, design to move the subject away from greenness through literate experiences. (p. 18)

Therefore, it is a great way of introducing learners to long narratives, a way to examine basic elements of literature such as plot, setting, structure, integrating concepts like point of view, figurative language as well as establishing character connections.

As Short (2011) voices, "Transformation occurs as children carry their experiences and inquiries through literature back into their worlds and lives" (p. 50). Thus, I propose to bring forward education that is incessant, dynamic and inseverable. Ecological education as a curriculum or program, which aims to bring into perspective the complexity of the natural world, its purpose and objective through different educational scopes which would present to the learner an opportunity to acquire substantial knowledge on specific topics using collaborative academic subjects simultaneously. As Rueckert (1996) elucidates,

To charge the classroom with ecological purpose one has to only begin to think of it in a symbiotic ^{xxi} term as cooperative arrangement which makes it possible to release the stream of energy which flows out of the poet and into the poem, out of the poem and into the readers, out of the readers and into the classroom, and then back into the readers and out of the classroom with them, and finally back into the other larger community in a never ending circuit. (p. 121)

Hence, the purpose of Ecological Education is to change our way of being, as well as change society and culture with the means of creating individuals who are much more sensible to their environment and provide them with the knowledge not only to see how that they impact the world around them but to become aware they are part of it.

Although teaching university students is important and beneficial to combat our

immediate ecological crisis, to our understanding of planet Earth, it is crucial for future generations to understand the ecological crisis they are to inherit. This will ultimately provide them with an insight of the importance of taking action towards a more feasible future. In brief, by providing children, teenagers and young adults with know-how of nature from an early age, contemporary society will enable them to change the world around them for themselves and encourage generations to come, with a different, more complex understanding of how actions and decisions made as a collective community.

Mainstream Popular Culture and Green Movement

The term *going green* has become the motif of the environmental movement during our time. As Dobrin (2011) states,

The metaphor “green” has been adopted as a way of indicating environmentally conscious political positions... Green has been naturalized as a metaphoric representation of nature and environment, a metaphor in need of reclamation. We must, for instance, also take into consideration that “green” can serve other metaphoric purposes, including the understanding that to be green is to be new. (p. 13)

As a result, one cannot help notice the sudden “green” boom that has invaded popular culture. The fad of “going green” has become a cultural aspect which has impacted our way of life and the ways in which we now confront our reality. For instance, “to ‘go green’ implies the active participation in environmentally or ecologically sound practices. To ‘be green’ is to advocate environmental protection, to be attuned to nature. To manufacture ‘green products’ is to make goods in ecologically friendly ways” (Dobrin, 2011, p. 13). However, most of the ways in which the term is used are erroneous and trivialize serious connections of the word.

Environmental vs Ecological

Nowadays the term ecological is used interchangeably with the term environmental or environmentalism^{xxii}, they are both different in practice and in theory. As Cheryll Glotfelty (1996) states in *The Ecocriticism Reader*,

We favor *eco-* over *enviro-* because, analogous to the science of ecology, ecocriticism studies relationships between things, in this case, between human culture and the physical world. Furthermore, in its connotations, *enviro-* is anthropocentric and dualistic, implying that humans are at the center, surrounded by everything that is not us, the environment. *Eco-*, in contrast, implies interdependent communities, integrated system and strong connections among constituent parts. (p. xx)

Consequently, for the purpose of this thesis ecological education will be defined as a science-based knowledge subject which connects all living organisms to their environment.

This definition, however, lacks focus, therefore, a closer look at what is ecology and the ramifications of said science is required. According to Dobrin's (2011) article "Through Green Eyes: complex visual culture and post literacy",

The science of complex ecology is most often credited to the work of George van Dyne, the first director of the Natural Resource Ecology Laboratory at Colorado State University (1970-1973), who argued for interdisciplinary methods of ecology and promoted some of the first systems-based approaches to ecology... Ecology, as it was adopted by Ecocriticism, was understood to be the study of the relationship between organisms and their environments and within such study it is considered legitimate to concentrate on specific organism—in the case of childhood studies and children's

literature and culture, this subject turned into child subjects –or on the environments in which those organisms thrive. (p. 20)

Hence, Ecology is the study of the interactions that take place between organisms and their environment. The focus of this science is studying ecosystems, meaning the all-living organisms (biotic) that live in an area and the non-living features (abiotic) of their environment.

Importance and Impact of Ecology

The science of Ecology has evolved over time and has morphed into its contemporary connotation. In the past, ecology meant being aware all life on Earth was interconnected, including the envisioning of the planet Earth as a living entity; but the modern ecological connotation leans towards human impact on other life forms and its implications. As Everden (1996) argues, “the conservation and environmental movements believe humankind cannot use any resources without seeing the consequences. Hence people see Ecology as a subversive science

...And so it is [sic], to a degree. Yet the ecology movement shares the same self-destructive embrace of the utility argument, and inevitably the demand arises for Ecology to *solve* the problem. If humankind cannot proceed with a certain development without undesirable consequences, then obviously it is the role of the ecologist to find a way for us to proceed with the development while avoiding the consequences. (p. 93)

Consequently, some of the reasons why the term *environmental*, in terms of educational subject matter, should be excluded from an educational perspective, during primary grade levels, as well as my thesis are the following:

1. *Singularity*- Meaning the term environmentalism focuses too much on the individual; it creates discordance within the purpose of the educational system, which is to instruct the

masses. It is also misleading since it teaches learners to worry only about themselves, regardless of the negative actions they may have to do, such as killing other beings or destroying their environment, to achieve or maintain survival (Howarth, 1996, p. 69-91).

2. *Superficiality*- Meaning the term environmentalism holds no depth on an educational aspect if used only to teach individuals how to survive instead of how to respect and coexist with other organisms and their environments (Manes, 1996, p. 15- 29).

3. *Negativity*- By using the term environmentalism, or rather the general definition of it, focuses too much on the negative impact human kind has had on the natural world. Education should be a positive experience; too much focus on the negative impact humankind has had on Earth would make the learner feel guilt-ridden, uncomfortable and would leave no desire for change or awareness (Fromm, 1996, p. 30- 39).

4. *Misusage*- Meaning the term environmentalism is taken out of context. For the most part, it is used erroneously, most people use the term *environmentalism* to refer to 'the natural world and how it is affected by human activity', when, in fact, they are referring to human ecology^{xxiii}, not environmentalism (Orr, 2011, p. 1-18; Rueckert, 1996, p. 105- 123).

On the other hand, by using the term ecology, from an educational point of view, educators will be expanding the student's horizon of learning not only as a language but of history itself, of their culture, as well as their community. Furthermore, the term ecological would eliminate the ethical dilemma of singularity and the other reasons stated above because we are teaching learners to act as a community while being conscious of the repercussions of their actions.

Subsequently, the field of ecology has been merging with other areas of interest, such as economy, ethics, philosophy and education, for centuries. As Howarth (1996) expresses in "Some Principles of Ecocriticism",

As an interdisciplinary science, ecology describes the relations between nature and culture. The applied philosophy of ethics offers ways to mediate historic social conflicts. Language theory examines how words represent human and nonhuman life... Each discipline stresses the relations of nature and literature as shifting, moving shapes—a house in progress, perhaps, unfinished and standing in a field. (p. 71)

Because the possibilities of fusing ecology with numerous fields of vast studies and, to a certain extent, overwhelming for the purpose of this thesis project, I focus on three specific areas: ecological literacy, ecological criticism and literary ecology.

Ecological Literacy

The term ecological literacy, was coined in the 1990's by David W. Orr, an American professor of Environmental Studies and Politics. He describes Ecological Literacy as “the ability to understand the natural systems that make life on Earth possible” (Norris, 2012, p. 1). What this means is that ecological literacy looks at how the natural world and its systems interact with humans. In other words, the influence nature has upon humans and how this impact nature. It informs students of global environmental issues and how to change the current way of living to a more sustainable system which resembles that of planet Earth.

According to Orr (2011), an ecologically literate individual is one who has a basic understanding of what ecology, human ecology and sustainability are (p. x). Some of the core aspects of ecological literacy are: Principles of Living Systems, Design Inspired by Nature, Systems Thinking, Ecological Paradigm and the Transition to Sustainability and Collaboration, Community Building and Citizenship (Ecological Literacy, 2011, p. 1)^{xxiv}. Hence, it is the ability to understand the natural systems that make life possible; for instance, in the manga^{xxiv} *Nausicaa of the Valley of the Wind* (2004) by Hayao Miyazaki, the main character is introduced to the

reader as a close learner and observer of nature, and this later helps her make decisions on how to help human civilization find harmony with nature (after centuries of damage by toxic pollutants) by following and understanding animal behavior, Nature's patterns and cycles of life.

Ecological Criticism

The second area is Ecological Criticism, described as "the study of the relationship between literature and the physical environment" (Glotfelty, 1996, p. xviii) in *The Ecocriticism Reader: Landmarks in Literary ecology*. Glotfelty (1996) states,

Ecocriticism takes its subject, the interactions between nature and culture, specifically the cultural artifacts of language and literature. As a critical stance, it has one foot in literature and the other on land; as a theoretical discourse, it negotiates between the human and the non-human. (p. xix)

This means Ecocriticism aims for three specific aspects: (1) creating or solidifying a sense of community; (2) analyzing the language used in the text to get an interpretation of nature through the point of view of the character, and (3) to making the readers realize they are affected by the description of nature in the text. For example, in *The Lorax*, a close look shows how nature is represented, what role does the physical setting play in the plot, how metaphors of the land influence the way it is treated and in what ways literacy itself affects humankind's relationship with the natural world.

Even though the target audience of Ecocriticism, as a topic of study, are college students, it is important to highlight that the Ecocriticist perspective can be taught at different educational levels. What this means is although Ecocriticism seems to be overly complex, it is not, however contemporary culture is so out of tune with nature, it has consciously or unconsciously instilled people to think. However, if aspects of Ecocriticism are introduced early on from primary grade

levels, to children, intermediate through superior, students will progressively build upon this knowledge until it becomes second nature to them. For instance, lower grade levels will have much more hands on experience with nature, literature and the way nature is viewed upon, much like Dewey's philosophy. Similarly, it is important that learners are presented with different points of view of nature, as well as, from literary and cultural points and discuss the ethical and philosophical views from a simple yet coherent standpoint. This will ultimately fuse philosophies like Freire's critical thinking pedagogy through awareness and praxis, and Grossberg's integration of popular and mass culture to pedagogy were both make learners aware of their thoughts, the intention of their behind words and actions as well as the implications of how culture influences not only them but all people in general.

Nature Writing and Ecological Criticism

In order to make this complex study of language and science more approachable to children and young adults, there will be a mergence between Ecological Criticism, (where students read and interpret nature from the perspective of others) with Nature Writing (where students write about themselves and their experiences with nature). The concept of Nature Writing would be introduced, not as a main component of ecological education but as an aid. Even though, it is important for students to get first hand experiences with nature in order for them to understand it, Nature Writing, which allow students to internalize their experiences with the natural world, this methodology would be partial.

Thomas L. Lyon (2001) points out in *This Incomparable Land: A Guide of American Nature Writing*, "the literature of nature has three dimensions to it: natural history information, personal response to nature and the philosophical interpretation of nature" (p. 21). Through Nature Writing, students will be able to permeate their thoughts, view of nature, how the natural

world is changing and the impact it has upon themselves and everything that surrounds them in a critical manner. Moreover, the use of nature writing will provide multiple composition opportunities where the student's progress is tracked, while they acquire a sense of place, identity and solidify their voices as writers as well as functioning as a scientific journal. Needless to say, most of the historical knowledge has come to know today of American flora and fauna were written during the colonial period and are works of Nature Writing, thus a vast majority of these works are also considered literary ecology.

Literary Ecology

Joseph W. Meeker defines the term literary ecology, in book the *Comedy of Survival* in 1997, as the study of literature with the intention of looking at the ecological topics and knowledge mentioned. These texts could vary in academic subject, but will still have an ecological topic as main focus. More importantly, "literary ecology is the study of the relationship between geographical place and the textual representations of place that attends to the ramifications and implications of that relationship" (Maucione, 2013, p. 82). Essentially, literary ecology is an exchange between ecologists, writers of ecological literature and Eco-critics. An example of this is *Little Red Cap*, where readers will look at environmental descriptions in the story to determine place, if the description was accurate, where do these places exist, how do they function and how have humans adapted to its ecosystem.

Ecological Education

Ecological Education may seem like a hectic and abstract approach because of the plentiful areas of study and research but that is not the case. It is important that students learn about ecology and its importance through literature such as *Little red cap* (1999), *Nausicaa of the valley of the wind* (2004) and *the Lorax* (1971), which I use in in this thesis. These texts have

proven to leave a strong impression on readers, shape the minds of children and young adults through the life of the characters who share the importance of the environment in the story. As Donald Worster explains,

We are facing a global crisis today, not because of how ecosystems function, but rather because of how our ethical systems function. Getting through the crisis requires understanding our impact on nature as precisely as possible, but even more, it requires understanding those ethical systems and using that understanding to reform them.

Historians, along with literary scholars, anthropologist and philosophers, cannot do the reforming, of course, but they can help with the understanding (Glotfelty, 1996, p. xxi).

In addition, these texts reflect the topic of environmentalism and the way humans relate to it through the eyes of a child or an adolescent, thus making it more relatable and approachable for the learners.

Therefore, by using these texts, we will not only be covering the three components: ecological literacy ecological criticism and literary ecology, but will also be using three major pedagogies. The first being Freire's critical pedagogy, which will ultimately be what creates change in the lives of the learners. The second is Grossberg's cultural studies pedagogy, which focuses on how culture influences the subjects as much as the subjects influence culture (Giroux, 2003). And the third one is Dewey's constructive pedagogy which is theory based on observation and scientific study. More importantly, it helps learners construct their own understanding and knowledge of the world through experiences and the reflection of them. This is important for learners because they will be able to take the knowledge already acquired along with the new experience and reconcile their beliefs and point of view through reflection and critical thinking.

The components and pedagogies, which play a significant role in the praxis ^{xxv} of Ecological Education, could be expanded depending on the areas one wishes to fuse with ecology such as economy, mathematics or biology. Nevertheless, the pedagogies mentioned above work side by side to give an in-depth understanding of the social and cultural tendencies which have led us to our ecological crisis while creating a balance between theory and practice. Also some concepts are used from Paulo Freire's Pedagogy, which misleadingly seem to play a secondary role, yet are core teachings that are fundamental, seeing that the objective of the thesis project is to make connections between literature, the natural world and the educational experience of the individual. For instance, one of the ways this could be done is through Nature Writing where the learner is faced with the challenge of applying academic skills such as writing encouraged to reflect upon nature while given the time to meditate their connection to nature and the world in order to create awareness and critical thinking skills. Subsequently, I argue for ecological education that is

1) *Universal*- meaning that it can be used in any country using local and non-local literature while retaining its essence without having to focus on problems like globalization. This will allow schools to set a formal educational program which is efficient and adapts to the different political, social, religious and financial aspects of life in every country.

2) *Transdisciplinary*- meaning it explores an issue, dilemma or problem by integrating multiple disciplines in order to connect new knowledge and deeper understanding to experiences. In doing so, the educational system could focus on establishing a formal education which helps students in small and extensive periods of time because the focus would be ecological thus making it relatable to any possible career the individual chooses in the future.

3) *Concrete*- meaning it is based on facts, although it uses literature as its medium. The reason for this being that education on ecological topics depends on literature from different fields or academic subjects.

As a result, Ecological education is a mixture of multiple disciplines, philosophies and pedagogies working together to achieve a more holistic educational career-driven experience for the learner as well as the teacher. Moreover, by using the term ecology, we are expanding students' horizon of learning not only a language, but of history, culture, place as well as their community. By implementing Ecological Education the division between formal and informal education would be blurred (similar to Dewey and Freire's envision of education), so students are aware that every moment is a learning opportunity. As a result, students will become conscious they themselves hold the key to their education.

Reconstructivism and Ecological Education

The main concern of ecological education is not only the acquisition of ecological knowledge but rather the opportunity for people to experience and comprehend ecology first hand so it can be translated into social change. As Grossberg (1992) notes, "popular culture is more than ideological: it provides the sites of relaxation, privacy, pleasure, enjoyment, feeling good, fun and passion" (p. 79). Therefore,

through practices of critical literacy, which encourages analyses and questioning of oppression and all forms of domination, readers are challenged to critique and question "what is" and "who benefits" as well as hope and consider "what if". Through critical literacy, children learn to problem-pose and question the everyday world, to interrogate relationships between language and power, to analyze the images and messages conveyed through popular culture and media, to understand how and why power relationships are

socially constructed and maintained, and to consider actions that promote social justice.

(Short, 2011, p. 52)

Critical Literacy, through Content-Based Instruction ^{xxvi}, will provide learners with a space to voice their opinions, question their values, beliefs and events that have happened in their lives as well as the lives of those they encounter. It will also provide learners the confidence to use their lives and experiences as tools for social and cultural change (Short, 2011, p. 52). Consequently, the enigma contemporary society and the 21st century education is faced with is the absence of a bridge between formal education (high culture) and popular culture. "One cannot expect positive results from an educational or political action program which fails to respect the particular view of the world held by the people. Such a program constitutes cultural invasion, good intentions notwithstanding" (Freire, 2004, p. 95). That is to say learner's experiences and knowledge should be used as a steppingstone for acquiring knowledge instead of being overlooked. By taking into consideration the experiences learners provide, their view of mankind's actions, interactions and way of thinking expands and changes.

There has been very little demand in terms of building an academic community that focuses on the importance of ecological issues present in the text or its influence on contemporary culture, although that is changing, therefore, it is our duty as educators to present new possibilities to learners. Since environmentalism and ecology are being explored and looked at closely during the last twenty years, this field has gained some attention, nevertheless, the majority of communities who address ecological topics tend to focus on nature as symbols or metaphors within the field of children's literature. In fact, it is because of this that teaching ecological issues through literature, especially fairy tales, fables or comics, is such a good idea

since the teacher has new material and techniques to touch upon ecological topics and so the students can get new perspectives on popular literature.

For instance, Fairy Tales like *Little Red Cap* (1999) are a way of introducing ecological issues to children since the majority of the learners are already familiar with the material provided so they can focus on nature and how it has affected their view of nature. This is particularly true for children who have come to age during the Disney Generation or Disney Culture flourish, who have constantly been fed classic childhood movies like *Sleeping Beauty* and *Beauty and the Beast*, which portray nature or rather wilderness as savage, wicked and something to be feared, since they are more likely to have a negative view of nature. The reason for this is that individuals, consciously or unconsciously, tend to be much more afraid and even traumatized by some of the images or books portray nature as a killer.

Although, one cannot claim reading a particular story has shaped the way we encounter nature, one can argue that multiple encounters with books which portray nature negatively, as well as limited exposure to nature, can convince an individual of. As Dobrin (2011) states

Children's literature has been identified as instructional or, more specifically, as acculturating, initiating children into the adult world by providing them with guidelines, values, and expectations about the adult world. Children's texts, even those considered to be fantasy or imaginary, were considered to be preparatory, design to move the subject away from greenness through literate experiences. (p. 18)

Therefore, it is a great way of introducing learners to long narratives, a way to examine basic elements of literature such as plot, setting, structure, integrating concepts like point of view, figurative language as well as establishing character connections.

As Short (2011) voices, "Transformation occurs as children carry their experiences and

inquiries through literature back into their worlds and lives" (p. 50). Thus, I propose to bring forward education that is incessant, dynamic and inseverable. Ecological education as a curriculum or program, which aims to bring into perspective the complexity of the natural world, its purpose and objective through different educational scopes which would present to the learner an opportunity to acquire substantial knowledge on specific topics using collaborative academic subjects simultaneously. As Rueckert (1996) elucidates,

To charge the classroom with ecological purpose one has to only begin to think of it in a symbiotic term as cooperative arrangement which makes it possible to release the stream of energy which flows out of the poet and into the poem, out of the poem and into the readers, out of the readers and into the classroom, and then back into the readers and out of the classroom with them, and finally back into the other larger community in a never ending circuit. (p. 121)

Hence, the purpose of Ecological Education is to change our way of being, as well as change society and culture with the means of creating individuals who are much more sensible to their environment and provide them with the knowledge not only to see how that they impact the world around them but to become aware they are part of it.

Although teaching university students is important and beneficial to combat our immediate ecological crisis, to our understanding of planet Earth, it is crucial for future generations to understand the ecological crisis they are to inherit. This will ultimately provide them with insight of the importance of taking action towards a more feasible future. In brief, by providing children, teenagers and young adults with know-how of nature from an early age, contemporary society will enable them to change the world around them for themselves and encourage generations to come, with a different, more complex understanding of how actions

and decisions made as a collective community.

Chapter 3: Methodology

What students lack in school is an intellectual relationship or conversation with the teacher.

—William Glasser

The following three titles selected for this thesis are *Little Red Cap* (1999) by Jacob and Wilhelm Grimm, *Nausicaa of the Valley of the Wind* (2004) by Hayao Miyazaki and *The Lorax* (1971) by Dr. Seuss. These books all are notable in popular culture and have large followings during the last four decades or so. Not only have these works made their way into popular culture through various movies and book adaptations, but have inspired music videos and video games. In the case of Dr. Seuss and Miyazaki, their careers were solidified by the popularity of their works and even launched one of the most important animation studios while *Little Red Cap* itself, is an adaptation of the original work called *Little Red Riding Hood*. In addition, *Little Red Riding Hood* and its few variations such as *Little Red Cap* have gone so far as to inspire more than 18 songs or music videos, ranging from synthpop hits in the 80's like "Hungry like a Wolf" (1982) ^{xxvii} by Duran Duran, Rock hits like "Call me when you're Sober" (2006) ^{xxiii} by Evanescence, to Glam pop songs like "Lollipop" (2007) ^{xxix} by Mika.

Interestingly enough, the variety of works inspired by *Little Red Riding Hood* are actually inspired by different versions of the fairy tale, yet called by its original name rather than the most popular in contemporary culture written by the brothers Grimm, Jacob and Wilhelm. However, for the purposes of this study, the chosen version focuses more on the richness in details found in the fairy tale and which is tamer in nature compared to its counterparts. Nevertheless, *Little Red Cap* is one of the most known and recognized European fairy tales; it has been adapted multiple times into different art genres and distributed around the world. Some of the most known are Carter's short story *In the Company of Wolves* (1990), the movie

adaptation of *The Company of Wolves* (1984) directed by Neil Jordan, a short black and white film called *Little Red Riding Hood* (1922) along with a 60 page comic titled *The Big Bad Wolf and Little Red Riding Hood* (1934) by Disney, a Broadway theatrical adaptation called *Into the Woods* (1987) by Stephen Sondheim and James Lapine, multiple comics and mangas based the brothers Grimm story and recently the fairy tale has made its way to the small screen with ongoing television shows like *Grimm* (2011) ^{xxx} and *Once Upon a Time* (2011) ^{xxxi}.

Because Little Red Cap (1999), or Little Red Riding Hood, have made its way to popular culture and into the minds of many children, teenagers and adults, the story seems appropriate because one is able to adapt the depth and topics, as discussed previously with Freire and Grossberg, one wishes to discuss depending on the level of maturity and age of the learner. Also because the story is recognized worldwide it is easy for people to find middle ground in it and create a sense of community between them. The familiarity of the story leads people to dismiss any details that are not part of the plot, such as wildlife. Contrary to Little Red Cap, the works of Miyazaki and Dr. Seuss have become famous because of the authors popularity, because of their controversial themes and/or because the text itself had a great following in popular culture.

Like many of Dr. Seuss works, *The Lorax* (1971) has had great popularity around the world, and had gained recognition in the academic world because of its strong political and philosophical tendencies. In 2002, it became one of the texts chosen by the National Education Association for the Teachers' Top 100 books for children, where it held the 14th place (nea.org). However, this book has also received much criticism because of its controversial portrayal of capitalism and anti-industrialist views during the time of its publication and was even banned in California in 1989 for its anti-logging tendencies.

Even though, *The Lorax* was written in 1971, it is clear its message is still relevant to contemporary culture, particularly because deforestation is one of the major global problems contemporary society faces. Still, there are other details, which made *The Lorax* (1971) one of the books I chose for this thesis, the most important one being that unlike the other books where the focus is concentrated on the main character, this book is centered around a being or deity which speaks for the forest. Another, aspect which caught my attention was the fact that Dr. Seuss focuses more on the plot than on character building and reveals the necessary information for readers to understand the events that took place and nothing more. The length, rhythm and poetic language were other aspects which influenced my decision as well as a male main character to balance out the appearance of *Nausicaa* (2004) and *Little Red Cap* (1999).

Also, *The Lorax* became one of the first books published at the beginning of the environmental movement, thus, influenced the making of literary and academic genres to come such as the Postnatural novel. Although, Miyazaki's work of literature, *Nausicaa of the Valley of the Wind* (1971) cannot be categorized as a novel, it follows the general descriptions of what the Post-natural novel, including its function of the landscape as a metaphor for "the pollution of the natural world, and attempts to show how that contamination inevitably transmogrifies one's experience of the earth itself" (196).

The intention behind using *Nausicaa of the Valley of the Wind* (1971) is to expand the teacher's perspective of what literature is and the many ways it can be presented to students while building the learner's reading rhythm. Introducing manga to learners also helps students to get in touch with other cultures and the importance literacy and their authors have upon that specific culture. For instance, Mangas' tend to have an author-based following. This means manga fans tend to establish a producer-consumer relationship with the author, in this case

Hayao Miyazaki, and will jump from a comic series to comic series exclusively based on the writer. It can also help students understand the impact specific works of literature have upon popular culture—seeing how the manga *Nausicaa of the Valley of the Wind* (1971) sold more than 11 million copies around the world by 2005 and served as a catalyst for one of the most famous animated studios in Japan, Studio Ghibli. Additionally, introducing Japanese comics to a curriculum offers the learner an outsider's perspective (meaning different culture or nationality) to a dilemma so that learners are able to see the dilemma from a different point of view.

Most of these books have a following, of different age groups as well as educational level, therefore it is easier for children to have heard of these stories before, know to them because they have watched their movie or television adaptations. Although, most of these adaptations have differences with the literary text, they can stand their own ground and give the viewer, reader or learner a main idea of what the story is about. These variations also allow the educator room to create class activities, discussion or assignments where students are able to name the differences between text and adaptation and the reason why they think the original work was replaced with new scenes. More importantly, I chose these books because they all fit into genres that are constantly challenged, because of their motifs or simply because they defy contemporary society and the practices they are valued for such as industrialism and/or the gain of territory because of invasive species. All three books have great ecological depth to them as well as giving the reader multiple perspectives and historical background of ecological topics and the way humankind has struggled to maintain itself in balance with nature.

I followed a student-centered method to choose the books that were going to be used as examples, because I preferred texts that were accessible for second language speakers as well as ecologically friendly and challenging. The main idea is to get them to analyze, reflect and adapt

the solution the main characters took in order to receive ritual understanding of their environments and their actions. By focusing on student-centered approaches, the teacher then becomes the facilitator and remains as a figure of authority and guidance, yet never being an authoritarian.

Another aspect that is beneficial for the teacher here is that he or she will be able to focus on specific needs the learners are facing and therefore is able to integrate small mini lesson to help the learner grasp specific ideas that may be causing them difficulty. In addition, because the classroom becomes a place where dialogue happened; it is a place where the community becomes involved, hence, the teacher or students are able to integrate local events or problems they may like to solve or have a closer look at.

Incorporating the concepts of ecological criticism, ecological literacy and literary ecology were crucial for the theoretical analysis of *Little Red Cap* (1999), *the Lorax* (1971) and *Nausicaa of the Valley of the Wind* (2004). These three literary genres provided and specified the main components that were going to be observed and analyzed. For instance, ecological criticism has three principles which are of most importance: 1) looking at a community in a literary text, thus building an academic community of literary exchange; 2) analyzing the language from the descriptions given by the characters, to see how the character themselves felt towards nature; and 3) analyzing nature based on all descriptions found in a text; this will set the tone for the reader as to how they should look at nature and approach it. Within this third principle, however, three guided questions, or aspects, are used to help the literary analysis be more focused; such as, 1) How is nature presented? 2) Are there any metaphors of nature in the text? and 3) How does this affect the reader's view of nature?

The second component is ecological literacy are divided into two principles which need to be analyzed within a text. The first principle being: How is life possible, meaning how are the environmental conditions depicted in the text. This question could be further subdivided into aspects using questions like: Is the environment appropriate for life? What type of wildlife does the environment hold? and How do they sustain themselves? The main concern of asking such questions is figuring out what type of climatic conditions the text presents? Is there water or other elements that could sustain the life of a being? If not, what does the author offer as an explanation for this phenomena? The second principle is natural systems and human interactions, meaning gathering on the description one could gather enough data to put together how the ecosystem works and how humans interact with said ecosystem.

The final component is literary ecology, which uses the descriptions mentioned in a text to locate possible geographical location. This component focuses on identifying geographical places based on the descriptions provided by the characters or narrator therefore one should ask questions like: What is the relationship between the geographical place and textual representation? and What are the implications of this relationship? Learner's will be able to get the necessary information by getting to know what space location (point) the story takes place in, as well as the ecosystems and wildlife that inhabit such place thus getting a better understanding of the ecological system in the story as well as the state it is in. By such description one could further investigate flora and fauna life cycles, their behavior, manner of reproduction and adaptations to environmental changes. One could also get to know if the geographical place is inhabited by humans? How this came to be? And why?

In order to repeat this type of literary analysis and present it in the classroom, one must first have an idea of what type of material you would like to present to the students. Although,

students will be able to select or give their opinion as to what book they would prefer, the educator must keep in mind a few things such as complexity of language, length, difficulty or complexity of a text and most of all, relevance. Even if the learners suggest works of literature they would like to read, the educator first has to research information about the texts to deem if they are proper in terms of content or relevancy to the class.

However, one of the major perks of ecological topics is that most books could be studied using ecological criticism, ecological literacy or literary ecology. One could apply these study songs, poetry, fictional works as well as nonfiction. Learners could also use these fields to analyze films, television programs, documentaries and photography, since most of these art forms are visual essays. The most important aspect here is that learners could feel free to study what is most relevant or significant to them and the educator is able to renew ecological education as time goes on by changing books, giving more emphasis to specific topics within ecology or simply expanding their knowledge by allowing dialogue with their students.

Assessing Children's Literature texts for Ecological Education

It is very important to understand Ecological Education can be taught by using different literary texts other than *Little Red Cap* (1999), *the Lorax* (1971) or *Nausicaa of the Valley of the Wind* (2004). The significant aspect of using children's literature texts for ecological education purposes is specific criteria, which will ensure the result of this research investigation to be reproduced later on.

In order to provide prospective educators practice in selecting, evaluating or using children's literature for ecological purposes, this research investigation used the following nine criteria: 1) academic purpose; 2) appropriateness; 3) availability and accessibility; 4) relevance and significance; 5) direct or indirect conflict; 6) Plot; 7) Multiple points of view; 8) relatable

characters; and 9) simple language. These criteria are discussed to give educators a better understanding of what each one means and what educators should focus on.

Academic Purpose

Although people may not understand how teachers assign their texts, homework or classroom activities, it is not at random, this should not be true. It is especially important for current and perspective teachers to know this too. One may not simply do an activity or a reading for the sole sake of keeping students busy, entertained or distracted. Contrary to general belief, a responsible educator always has a valid justification for their actions and those of their students. That is to say, learners are assigned a reading because it will give them a better understanding of specific a concept, topic or conflict –such as deforestation, how deforestation affects all organisms on Earth and man vs. nature— or because it will reinforce a previous lesson. One does not assign a text because it explains what deforestation means and never again touch upon the topic, because the text explains it better than you can or simply because you are forced or supposed to do it.

An educator must know why they are assigning a text or creating an activity, how to best present it so students are able to grasp the information better and where learners need reinforcement. They should also know who learns through different teaching techniques and when to move to another subject. Having an academic purpose means one must always come prepared to class, have goals and objectives for everything one does in a classroom and be flexible to accommodate student's interests and queries on topics. It also means they are responsible for being able to manage the time they will have for each action they take and be reasonable to the time they assigned for each topic or concept.

Appropriateness

Every educator has to be aware of what is acceptable in a classroom every day by making judgment calls as to what is respectable and what is not acceptable for learners. Similarly, all actions, activities and or text given to learners must take into account his or her learner's age, maturity and culture. That is to say, educators must be conscious of the material they bring to class and share with their students. The materials, assignments or events have to be screened or evaluated at before using them in the classroom in order to prevent an atmosphere where students feel uncomfortable, threatened or disrespected. For instance, just because a song is relevant to the topic does not mean the educator is obligated to show the video to the learners, especially if said video is racy, raunchy, disrespectful or unfitting to the topic or the student's age. This may seem obvious, but one would be surprised as to how many educators seem to ignore this remark.

Every learner is unique in his or her own way, and even though we cannot create or adapt an assignment for each student, the educator has to find neutral ground so students are able to learn properly. Get to know your students, their age, culture and background; this will aid you when addressing sensitive topics or situations appropriately. Do not assume all students have the same background, come from a privileged family or live under the same circumstances regarding what tradition acknowledges as norm. This is especially true when taking into account the learner's maturity and cultural background; one of the most important aspects of creating a healthy educational classroom is respect and appropriateness.

Availability and Accessibility

Making sure the texts an educator uses in the classroom is key for critical thinking and academic growth. However, it is important to point out there are many cases where students are

not able to buy the assigned texts because of scarce resources. Because of this, it is important educators make the text assigned physically accessible during school hours so learners are able to study it in depth at their own pace or inform students of its availability at the school or local library. This does not mean the educator is responsible for supplying each student with the material assigned but rather inform learners when and where the materials are available for their use.

Another aspect an educator must consider is how accessible is the material assigned is for learners; especially in a country like Puerto Rico, which lacks bookstores and has limited or outdated sources in the English language classroom. The circumstance of accessibility also brings into light the technological period argument, which claims all 21st century students have access or are owners of electronic devices and therefore have access to electronic texts. However, the technological period argument is not true and does not reflect the reality of many students whose families are not financially stable, thus, cannot afford a computer or tablet, much less internet access.

The technological period argument could also be applied to many schools, which are financially struggling to maintain or acquire the limited resources the government provides them with. There are countless public schools, in many countries such as Puerto Rico, which have no computers labs, or the necessary resources to maintain said computer labs, and therefore cannot provide learners the opportunity to use electronic sources during or after school hours. In addition, the use of strict electronic sources brings into perspective the legitimacy and ethical practices to appropriate said materials; especially if learners and educators are able to access the assigned materials via illegal downloading or pirating.

Relevance and Significance

A significant part of engaging learners is finding materials they find relevant to their lives, interests or culture. Doing so would be irrational and impractical for many reasons –such as outdated language or expressions or the length of his work—but mostly because many, if not all, elementary students would know who Shakespeare is or be interested in his texts. Because of this, educators must always be aware of what intrigues their learners, why and how they could incorporate it to lesson plans. For instance, educators should avoid using texts with extremely difficult vocabulary such as Shakespeare to teach the English language to elementary students.

Similarly, the quest of engaging learners is also based on how significant a text is to them as a community or as individuals; namely, there is no point on presenting a text to students if there is no cultural, emotional or physical attachment or sentiment towards learners. In order to engross students, they must be emotionally or intellectually invested on the text or research subject. This entails educators have to keep up with popular culture and the way it impacts learners. However, this does not mean an educator is obligated to use mindless or tasteless aspects of popular culture to keep learners engaged especially if students are not able to gain anything from it.

Direct or Indirect Conflict

An important aspect of making students aware of how every aspect of life is connected to nature is making them aware of the conflicts society phases as it evolves and how literature or depicts them. More importantly, educators who are interested in teaching ecology have to be aware of choosing texts which have humankind vs. nature in it; either directly or indirectly. That is to say direct conflict, like the one seen in *Lorax*, in when the problem is portrayed in an explicit manner to the readers upon first inspection. Direct conflicts will present ideological

struggles on its content while indirect conflicts make an allusion to the conflict but is not overtly addressed in the text. Furthermore, indirect conflicts come into perspective when the reader does an in-depth analyzes of the text or is focused on a specific area of interest and how it influences the readers view point, such as Little Red Cap examined from an ecological viewpoint.

Needless to say, most learner's conflict with nature will be influenced by three major ideas. The first is how the Educational system has taught us about nature, agriculture and sustainability from a colonial perspective. This is especially true to Caribbean countries such as Puerto Rico, who have been colonized by nations with greater power to exploit its land. Location or place is looked upon as an object of value to be owned by individuals of power. The second notion is learners are discouraged to practice or know about the topic because of the prejudice behind it such as working on agriculture is for people of low socio-political status or people who are discriminated against because of their financial or ethnic background. That is to say, learners, consciously or unconsciously, prejudice towards agricultural or manual labor because they associate it to slavery, genocide, mockery or humiliation. The third notion is how learners know theory but do not know how to apply this knowledge to their daily practices.

Plot

It is important for educators to select texts or materials which have a plot; meaning a structured narrative which can be explored from an intellectual stance. Similarly to academic purpose, this will ensure learners are able to follow the story as well as analyze different aspects of it. More importantly, ensuring the material assigned has plot gives learners a better focus as to what they are looking at, what is important and what is of value to the assignment. It also ensures learners are receiving well thought out lesson plans and well as ensuring educators how

well learners are able to comprehend and scrutinize how the information given to them could be connected to their personal experiences or other texts.

Multiple Points of View

One of the dangers of teaching learners only one point of view is manipulating them into believing there is only one course of action or ideology. Taking this sort of action is not only unethical, since it provides for a hidden agenda, but also oppressive because it would take away the learner's ability to think on his or her own. It is the job of an educator shed light on the different points of view presented in the text, but most importantly, discussing the implications and ideologies behind each one. Showing multiple points of view allows learners to analyze the cons and pros of each situation to consider the option and to be better critical thinkers.

Relatable Character

Another way of engaging learners is making them feel connected to the characters or that have similar circumstances or personality. For instance, children or young adults are more susceptible to emulate or follow the example of a young character than an adult character because learners are able to identify with the way in which the character expresses itself. Similarly, texts with young characters tend to integrate the struggles teenagers phase to become an adult and find their place in society. Topics like identity, self fulfilment, acceptance, integration and change, are popular by default to young audiences because they resemble the reality learners of similar ages struggle with. Other aspects which can make characters relatable to learners are speech patterns, mannerism, and reactions to different situations, people or environments.

Simple Language

Another aspect teachers should consider of is the language. For example, the complexity of the vocabulary used in the text not the spoken language in which the text was published or studied. A text written in simple language or vocabulary will not only help learners have a better understanding of the narrative but also will allow students to be engrossed in the reading easily. Because of this, learners will have more opportunities to think critically on a text than having to first understand the complexity of the vocabulary and later its literary elements. Furthermore, using materials with simple language will ensure easier readability for learners of all grade levels and education.

Chapter 4: Literary Analysis

The teacher who is indeed wise does not bid you to enter the house of his wisdom but rather leads you to the threshold of your mind.

—Khalil Bigram

This chapter is a detailed literary analysis of *Little Red Cap* (1999) by the Grimm Brothers, *The Lorax* (1971) by Dr. Seuss and *Nausicaa of the Valley of the Wind* (2004) by Hayao Miyazaki using three components: 1) ecological literature, 2) ecological criticism, and 3) literary ecology in-depth. In order to deconstruct and reconstruct the texts mentioned, the components above will be divided into principles and aspects so as to get a better understanding of the multiple perspectives the texts provide. *Little Red Cap* (1999), *the Lorax* (1971) and *Nausicaa of the Valley of the Wind* (2004) will also be looked upon from an ecological, philosophical and educational perspective.

Little Red Cap

Little Red Cap (1999) was written by Jacob and Wilhelm Grimm, also known as the brothers Grimm. Even though, the date of publishing is unknown, the better-known version was published in 1857. The story was influenced by Perrault's *Red Riding Hood* and Ludwig's dramatic tragedy, *The Life and Death of Little Red Cap*. *Little Red Cap* is different from Charles Perrault's *Little Red Riding Hood*, yet it preserves the main ideas of the original one.

The fairy tale follows the life of a little girl who has to visit her grandmother to deliver some food. On the way to her grandmother's house, the little girl stops and speaks to the wolf, who travels to her grandmother's house and presides to it the little girl and her grandmother. The huntsman later cuts the wolf open and both females are saved. Unlike Perrault's original version of *Little Red Riding Hood*, the brothers Grimms' version, *Little Red Cap*, is a moral of the story

which focuses on teaching children to listen to their parents and to never stray from ones original path.

Components, Principles and Aspects

1. Ecological Criticism

A. Community

There are a few signs of formed communities in *Little Red Cap* (1999), although the folktale does not stress or even confirm the existence of any community beside that of little red cap, the huntsman and her mother. Nevertheless, it is important to know a community is present, and how the existence of this community had shaped the actions which were to take place for little red cap. For instance, if there had been no other children who had experienced wolves coming near them, the villagers would have not been so wary of the actions of the wolf. This is rather significant because it allows the reader know two things; the first being the community in which little red cap lived in had a steady child population and the second being wolves had studied the community enough time to know when the children would separate from their guardians or how little red caps community had settled in wolf territory and preferred to live with the consequences of it.

Another example of the existence of villager is the road, which was made to lead villagers into and out of the forest, meaning the place was commonly traveled by the villagers of a little red cap and other peripheral communities. This would ultimately explain the presence of the huntsman and why he was traveling the woods alone even though it is in a remote location of the forest. The third existence of a community is little red cap's grandmother, who at her old age and physical condition, was removed from the community in itself because she no longer had a useful purpose in it. This, without a doubt, means there was a thriving community which could

only allow active members to remain at a close proximity in order for them to be more accessible to work and to get to work, which means it not only is a stable community but a growing community.

B. Language (View Point of the Character)

There are only two viewpoints the reader is allowed to hear in this fairy tale, the first is the wolf's perspective of nature. Nevertheless, the wolf's voice is not completely heard because the fairytale changes back and forth between the perspective of the wolf and the third person narration. Regardless of this, the description is rather short but it describes nature from different stances. For instance, when the wolf states,

Listen, Little Red Cap, haven't you seen the beautiful flowers that are blossoming in the woods? Why don't you go and take a look? And I don't believe you can hear how beautifully the birds are singing. You are walking along as though you were on your way to school in the village. It is very beautiful in the woods. (2004, p. 1)

From this we can assume the wolf is both in tune to nature but more importantly that he was wary of human activity. Although it may seem unlikely to some, the wolf is unconsciously letting the reader know of how keen his senses are, not because he can hear the birds and keep an eye on his surroundings but because he is doing so while talking to the little girl. Even more fascinating, is the fact the wolf is able to separate how urgent the girl's task is based on her footsteps and how lightly or quickly her feet moved.

The second point of view is the narrator, which the reader gets to know through the tale for a limited amount of time. The fact that the narrator is omniscient^{xxxii} and omnipresent^{xxxiii}, does not mean the reader is able to decipher if the narrator is being objective. Moreover, one

cannot be sure the narrator has a written agenda and so the perspective, or rather what the reader can get from it is limited.

C. Analysis of Nature Based on Description

In terms of how nature is depicted relies on two different perspectives: the first being the narrator and the second the wolf. Because of this, the picture of nature the reader encounters is diverse, thus making it more likely for the reader to separate the wolf from nature, even though it is part of the ecosystems wildlife. For instance, the narrator only points out a few descriptions of nature such as "woods" (2004, p. 1) when refereeing to flora, as well as giving specific examples like "three large oak tress" (2004, p. 1) and a "hedge of hazel bushes" (2004, p. 1) while stating "wicked animal" (2004, p. 1) when referring to the wolf. As a result, the reader is given the notion as to approach nature cautiously since its depiction is of a colonizer who only uses nature its natural state as guide points or to treat it with care or acknowledge if nature is domesticated.

The opposing view comes from the wolf. In fact, it is the most interesting in terms of how readers perceive nature since the reader can visualize were little red cap is and how lovely nature is, including singing birds and wildflowers. Consequently, the reader is taken on a journey with little red cap to notice nature for the first time.

Little Red Cap opened her eyes and saw the sunlight breaking through the trees and how the ground was covered with beautiful flowers. She thought, "If a take a bouquet to grandmother, she will be very pleased. Anyway, it is still early, and I'll be home on time." And she ran off into the woods looking for flowers. Each time she picked one she thought that she could see an even more beautiful one a little way off, and she ran after it, going further and further into the woods. (2004, p. 1)

Although, the little girl at this point opened her eyes to nature and is in a state of awe, the reader cannot or will not allow himself to become attached to this joyous feeling because they are anticipating a tragic outcome. Therefore, the only positive viewpoint during the story is overlooked and simplified by attributing the girl's eagerness to learn about nature to ignorance and finally her downfall. As a result, the view of nature goes from somewhat useful to mankind to extremely dangerous.

This description also provides the reader with a dual perspective of the setting based on the same character, which is rather difficult to come by in a fairytale or a story. The superficial viewpoint would be the one stated above were the wolf gives nature a romanticized viewpoint, only mentioning to little red cap what she would have found beautiful and defenseless. By doing this, little red cap would have not been so wary of the wolf's actions and felt more at ease to roam the forest. Yet, there is a dualistic underlying perspective of a predator and what is left unsaid about the environment that surrounded them. What I mean by this is the wolf omits to mention anything he used until then to camouflage himself and his presence such as trees, shrubs or simply stalking the girl from afar, yet remain within the forest, as to not call her attention. Even if the wolf had waited to talk to the girl on the path constructed by the villagers, he had to wait long enough around the area, scout for a place to hide and wait to make his presence known as far away from human activity in order to not be discovered.

Another important characteristic is the fact that the characters in the text felt unsafe if there was a wild animal alive, therefore both scenarios have gruesome endings for the animal. This suggests the humans in the story felt comfortable with nature as long as nature proved to be submissive, as a lifeless object or if it posed no danger to humankind. Interestingly enough, it was the wolf's existence and encouragement that made the little girl see nature for its true form,

even suggesting a transcendental experience since she was not aware of the beauty of nature until the wolf had pointed it out. In fact, people tend to overlook or ignore the significance of the wolf and the story and misinterpret his existence as one of wickedness, when his actions are, without a doubt, the most important because it allows the main character grow intellectually, emotionally and psychologically.

However, the most important or significant attribute which shows the poor relationship between humans and nature when the huntsman kills the wolf and then he is seen as a hero-the savior of two innocent souls, while the death of little red cap and her grandmother is seen as something atrocious, savage and as an act of pure evil. More importantly, the fact that the wolf has to suffer through the pain of being cut open with a pair of scissors, stuffed with stones and murdered depicts the viewpoint of the characters of the story where animals are inferior to humans thus one should not feel guilt to harm or kill them. Not only that, but "The huntsman took the wolf's pelt" (2004, p. 2), inferring that one should take pride of hunting and brutally killing animals by taking his pelt as a trophy or reward.

Furthermore, Little Red Cap (1999) is one of the few fairy tales which involves walking as a common act of human behavior and a metaphorical act of passage of time, intellectual maturity and meditation. Although, this may seem mundane, the truth of the matter is that we all partake in this activity, either physically or mentally, making her actions relatable and charming. As Solnit (2001) articulates, "the history of walking is everyone's history.... Walking itself is the intentional act closest to the unwilled rhythms of the body, to breathing and the beating of the heart. It strikes the delicate balance between working and idling, being and going" (p. 4-5). Using walking as a metaphor, the fairy tale of little Red Cap gains more depth; it is no longer seen as a corporal act but as a physical representation of moral gain.

Even more fascinating, is the idea of using walking as a metaphor for transcendence, a philosophical concept that means “to go beyond” or to surpass human cognition. “Walking, ideally, is a state in which the mind, the body and the world are aligned, as though they are three characters finally in conversation together, three notes suddenly making a chord” (2001, p. 4-5). As uttered by Solnit (2001),

Walking should be called a movement, not travel, for one can walk in circles or travel around the world immobilized in a seat, and a certain kind of wanderlust can only be assuaged by the acts of the body itself, in motion, not the motion of a car, boat, or plane. It is the movement as well as the sights going by that seems to make things happen in the mind, and this is what makes walking ambiguous and endlessly fertile, it is both means and end, travel and destination. (p. 6)

If one then takes this into account, there are a few events which acquire significance since the reader is no longer seeing the little girl walk to her grandmother's house, the reader is observing a physical representation of philosophical state of mind.

The second event, subsequently, is a metaphorical exchange between the wolf and little red cap. Here the character of the wolf and the little girl become one being in a mutual mental and physical landscape combined by their actions, while the little girl partakes of the physical act of walking, the wolf becomes part of ‘the world’, as Solnit (2001) voices; it is within this moment ecological citizenship takes place. As a result, we are no longer watching a little girl travel to her destination but rather we are spectators of a pilgrimage. “Pilgrimage unites both beliefs with action, thinking with doing, and it makes sense that this harmony is achieved when the sacred has material presence and location” (Solnit, 2001, p. 50). The sacred being portrayed

through the wolf and the location animated through the forest or woodlands, which, in turn, have a strong pantheistic influence and tendencies.

The fact the wolf makes mention of little red cap's feet and the way in which she walks is very questionable, for some it is a pointless remark, other than to state how fast she travels. This observation, however, provides an insight as to how the minds of the characters work. As Solnit (2001) points out,

The rhythm of walking generates a kind of rhythm of thinking, and the passage through a landscape echoes or stimulates the passage through a series of thoughts. This created an odd consonance between internal and external passage, one that suggests that the mind is also a landscape of sorts and that walking is one way to traverse it. (p. 5-6)

Therefore, the actions and reactions of both the wolf and the little girl, provide insight of the way in which their minds work. The first notion being a physical and instinctive interaction; the wolf was not able to concentrate on the task of completing a hunting plan for the little girl before because her pace was too fast and therefore, he was bound to observe her and study her from afar multiple times. The wolf was both an observer and active learner of human behavior, yet retained an outsider perspective of how, why and who little red cap was. The second idea, however, is a passive perception of the psychological or intellectual capacity of the little girl, since the wolf mentions it. One can assume little red cap had many thoughts on her mind, most likely having to do with her life style since she was on her way to school or because of stress caused by social expectations and cultural traditions.

2. Ecological Literacy

A. How is Life Possible?

The environment presented in *Little Red Cap* (1999) is more than appropriate for life regarding how different parts of a healthy ecosystem are mentioned in the book such as sunlight, growing flowers on the forest floor and singing birds. Although, this may not seem like a lot, it provides variety of facts such as moisture of the soil, how fertile the land is and what type of animals lived near little red cap's village. For instance, in order for a wide range of wildflowers to grow, there must be a good source of water nearby, since no aquifer is mentioned, one can assume the place described is constantly showered with rain keeping the soil wet. Because the Woodlands and forest tend to have thick flora, it also means the constant rain helped keep the soil rich in nutrients, as well as helping the loose leaves decompose faster and serve as nourishment for other plants.

The mention of different flowers also means there is a wide variety of flying insects such as bees, butterflies and flies which would help pollinate and spread their seeds around the forest floor as well as land insects. This small array of animals would then serve as food for the singing birds, along with other sources of nutrients such as wild fruits and nuts. The existence of all of these elements also means the area was big enough and fruitful enough to hold both small animals and big animals like wolves without jeopardizing the ecosystem's balance.

However, the lack of detail in terms of season and other animals the wolf could have targeted make the reasoning behind the attack even more mysterious. Since the heavily dense woodlands tend to not filter a lot of sunlight unless there is a clearing, it is Spring or Summer. If this were the case, then no wolf would feel the need to go near a human populated area, specially since they would be caring for their young or searching for a mate. Regardless, the reader tends

to forget the wolf is looking for food in what we assume to be an isolated place, however, there is no documentation of healthy wolves attacking humans or hunting for food without other pack members.

B. Natural Systems and Human Interaction

Upon closer inspection, the interactions in the fairytale have hidden messages or viewpoints which are significant for literary analysis such as power struggle, survival methods, intellectual capacity and natural and instinctual capability. For instance, when we look at little red cap and the wolf's first interaction, one can see various hints of power struggle between nature and humans. A few of these can be the physical disadvantage the wolf has over little red cap, the anthropocentric ideal that humans are the ultimate or superior species and the importance of the place in which the action unfolds and how it aids or hinders the characters outcome.

The first of these interactions is between nature, little red cap and the wolf, thus setting the pace and nature of the character's relationship. During this scene, the wolf encounters and engages in a conversation with little red cap, which suggests the wolf's need to be acknowledged and its search for power as well as the need to establish authority over the little girls and therefore humans. In current society, the wolf is seen as superior as having an advantage over the young girl because it (the wolf) is healthy, strong and intelligent. The fact that the wolf approaches the girl first could be interpreted as a sign of resistance or challenge towards human society. It means the wolf is confident, to the point of arrogance, to hunt in a place like a forest, which is its natural habitat, thus coming out victorious at both the intellectual and physical level.

The second encounter was between the wolf and the grandmother. Here the wolf is seen as an opportunist with sadistic tendencies since it brutally gobbles a weak, sickly and defenseless

old woman. The fact that it attacked its prey without hesitation makes the character seem cold hearted and because the grandmother is not offered a chance to struggle for her life hence it makes the wolf seem tyrannical. This interaction also shows how the wolf is a threat to humans; an aggressor towards individuals who maintain their way of life (the elderly) and devour and destroy the future of humankind and its society. Not only was the wolf murdering a child but murdering a girl that who in time could have bared children thus threatening the future of a specific community, which also suggest to some extent the animal's intent to enforce genocide when he feels threatened. This scene is rather complex because it suggests the wolf is not better than a healthy human, who tends to be more skillful or capable of defeating a wolf, but rather it implies how the wolf was allowed to kill the old lady because of her own negligence. Not only that, but seeing how the grandmother was separated from society herself, she is seen and treated as someone who is no longer of use to society other than from her knowledge, thus she is pushed outside of the perimeters of society and treated as someone of an inferior societal status.

The third and last encounter is between the huntsman and the wolf. Because it was the huntsman who attacked first, this implied a human over powered the wolf. This action then illustrates a change in the power within the fairy tale and how the character of the wolf is seen, consequently this event is seen as a power shifting moment where the wolf is no longer deemed at as a figure of authority but rather as something that has to be killed and disposed of. The wolf is emasculated and humiliated by the huntsman since the human male overpowers it in strength, intellect and adaptability as well as presenting humans as undoubtedly superior figures who feel satisfaction seeing others struggle for their life or acceptance. It also shows how mankind tends to think they can adapt to anything which comes their way; including other people, events or places.

3. Literary Ecology

A. Relationship Between Geographical Space and Textual Representation

It is difficult to say where fairytales like *Little Red Cap* (1999) take place other than pointing out its European heritage, however, because the brothers Grimm are from Germany, it is safe to assume they integrated part of their culture, flora and fauna to the fairytale. Therefore, it is important to let the reader know that places like the one described in the story do exist in contemporary Germany as well as centuries ago. In fact, Germany is one of the most densely woodland countries in Europe, with places like the Black Forest, that resemble the flora and fauna of *Little Red Cap* (1999).

In terms of wolves, it is important to say Germany had a big population a few centuries back, but these animals were hunted down and are now protected by the government as an endangered species. As a result, the wolf most likely found in Germany's forest, when this folklore came to be, was the Eurasian wolf. The Eurasian wolf, scientifically known as the *Canis lupus lupus*, is a subspecies of the grey wolf and was common in Russia, Mongolia, China as well as Western Europe.

B. The Implications of Said Relationship

There are very few implications of how humans come to see the relationship between the geographical place and the textual representation of its flora and fauna other than that of the wolf. However, it is also the most significant in terms a maintaining an animal alive and the role the animal plays in nature. Wolves, in Germany and around the world, have been hunted down because they are believed to be evil, unnecessary or too dangerous to keep alive. It was not until a few decades ago when scientist began studying wolves and discovering they were an important part of the ecosystems since they "hunt out the weak, the sick, the old, and the injured. They help

the population of prey animals like the elk, deer, moose, and caribou, by taking away the weak and letting the strong survive”(wolfcountry.net). This in turn means animals, which live in herds can become stronger and have a better chance at surviving by breeding amongst the strong members of the species. By doing this, wolves also control the population of deer or similar animals, thus their population remains under control and they do not starve because of overpopulation.

Nevertheless, stories like *Little Red Cap* (1999) negatively influence readers into believing animals like wolves are dangerous without knowing how these animals are in real life. By studying wolves scientifically and keeping a neutral standpoint, learners may understand wolves as complex animals and their behavior before taking action. Even more important, is the fact that stories like this have become popular in mainstream culture with show like *Grimm* (2011) or *Once Upon a Time* (2011), where new generations of individuals feel attracted to fairytales and the original texts, thus perpetuating the wolf's negative portrayal.

Ecology

From an ecological perspective *Little Red Cap* (1999) presents a challenge or a dilemma because of the little biodiversity data mentioned in the fairytale, especially since the length of the story is short (in terms of word count) especially since its classified as a short story. However, one has to point out how simple the story presents the setting of the story. Although Jacob and Wilhelm Grimm's version of the fairy tale tends to be more detailed about the flora and fauna, it is still an incomplete picture of the wilderness portrayed. That is to say, the forest of wilderness in the story seems rigid or stoic and to a certain extent makes the setting of the story unnatural. That is to say, the wilderness is described as second hand knowledge instead of a person who has

experienced wilderness in the story first hand. Thus, it is up to the reader to fill in the picture as to how wilderness works and how its many components behave and interact.

Because some of the setting is too peaceful, almost like a clearing within a dense forest, which holds a path for human use, one could say there is extreme deforestation, in particular parts of the forest closest to human settlements. The reason for this is because the only way for flowers to grow around a dense forested area, is for sun rays to reach the soil bed, which is extremely difficult to happen if there are no open spaces in tree canopies; even when this forest is made of pine trees.

Events like the ones stated above are known as microsystems^{xxxiv}, which are particular because it has its own climate, flora and fauna. Because microsystems behave differently from the rest of the forest fauna, there will always be a difference between it and the forests' ecosystem, even though, they are linked to each other. Similarly, microsystems could also be the result of deforestation, although this particular option would be less pastoral^{xxxv} than the ones the fairytale depicts.

Education

From an educational perspective, there are a few situations a reader must analyze in order to get a better understanding of the story. For instance, the reader must ask if the story is meant to be taken from a metaphorical standpoint and if this is the case, the reader should try to answer questions that may lead to a better understanding of the tale, its characters and its purpose. Some of questions would be if the places and characters are metaphorical: What is the tale trying to compare? What is the purpose of the story and its characters? Were the characters actions dictated by fear? How so? Does the metaphorical murder of the wolf represent anything in particular? Do the means justify the end?

If the tale is taken from a factual or objective context, then other questions must be taken into consideration such as: Is the tale plausible? Could the story have taken place in another location and preserve its message? Does the tale contain any facts about the people, flora and fauna? Does the text present any message or purpose? Why does the wolf kill the grandmother? Was there no other wildlife? Why do humans feel the need to kill the wolf without considering other options? Were there any other options? Did the characters have any other options? Did the act of killing change the character's perspective of life? Consequently, these questions will not only make the reader internalize the story, but also provides them practical exercises for critical thinking.

Philosophy

In *Little Red Cap* (1999), one becomes mindful the little girl's journey is not only a mundane task assigned by her mother but a pilgrimage^{xxxvi}, with the purpose of creating awareness. The pilgrimage presented in this tale is unique in its own way because the main character becomes mindful from it in two different ways. The first is self-awareness, in which the little girl learns she is able to make her own decisions and allows herself to do so. Deviating from the behavioral structure imposed by her family turns her into an individual who has reached maturity and, therefore, deserving of respect.

The second is of one's identity through actions and consequences, within the parameters of one's reality and circumstances. This occurs in two different occasions, which depends on the reader's perspectives of the story. The first is the little girl's detour to the flower field, whose first act of consciousness is to destroy or take whatever pleases her with no immediate consequences. That is to say, one cannot hurt that which cannot feel. The second act of awareness concerning actions and consequences is killing the wolf as a result of the carelessness

and naivety towards others circumstances. That is to say the wolf was killed because humankind's reaction towards that which they do not understand is to kill or destroy. As a result, the child becomes aware of death by killing. In other words, that which can feel and react to one's actions. However, this happens after the moment the little girl realizes she could have acted differently if her actions would have been less hasty. Regardless, *Little Red Cap* (1999) acts upon her environment rather than react upon it.

The story *Little Red Cap* (1999) provides the reader with an in-depth look at an ordinary character who takes control over her own destiny by achieving awareness of the self and acting upon it. This anti-romantic view of the story and character creates a rift between appearance and reality. This is especially true if one believes the purpose of the story is to warn readers about one's choices and acceptance of its repercussions without blaming others for one's actions. Therefore, this fairy tale transcends the genre of folklore and enters the genre of *bildungsroman*^{xxxvii}, a coming of age story which gives the reader a glimpse of the obstacles the character faced and the knowledge they gained by going through this experience.

Lorax, The

The Lorax (1971) is a book by Dr. Seuss and published in 1971. It is considered to be a fable for its use of personification and strong moralistic values of environmentalism. The three main points in the story focus on nature; the Lorax, an entity who speaks for the trees and the greed of the Once-ler.

The story expresses how the Once-ler along with his family, take down all the Traffula Trees, to make his invention, the thneed and become a wealthy. After the first tree is cut down, the Lorax appears and tells the Once-ler to stop, but the Once-ler refuses to listen to him time after time until all the Traffula tress are cut down. The Lorax and all the creatures who live in the area are forced to leave and find refuge somewhere else.

The Once-ler stays in the area where the Traffulas were and waits for someone who cares for the trees to appear. After a child inquires him about the trees, the Once-ler redeems his past actions by gifting the child with a Traffula seed and telling him how to take care of it. He also tells the child to grow a forest and protect it from others cutting it down so that one day all the animals and the Lorax would return.

Components, Principles and Aspects***1. Ecological Criticism*****A. Community**

In terms of community, the only clue the readers get is the first picture where the little boy leaves the city to come in to contact with the Once-ler. In other words, the opinion or the people of the community are muted and indirectly represented either by the little boy or by the Once-ler when he still participated or lived in society.

However, it is also important to point out that the little boy never actually communicated with anyone other than the Once-ler, meaning that readers may assume the boy lived in a community based on the illustrations. Because of this, it is rather difficult to prove a point of how the boy symbolizes our society or human costumes, rather readers are to take the boy's appearance at face value and expect the boy to be a voice of reason behind a society that has lost all contact with the natural world in its organic state.

Another fascinating aspect of community in this book is the Once-ler's family, which comes to the area once rich in Trufulla trees and disappeared as soon the trees became escarze and would no longer provide them with some type of profit. More interesting is the fact that these people are never actually represented in book other than "as the middle man" for the exploitation of the geographical location.

B. Language (Language for Interpretation Through the View Point of the Character)

Because the story follows or begins with the young boy making his way to the Once-ler's house, how he seems to look at nature and how his view point is affected by the interactions he has with nature is important to analyze. For instance, where we first come to know where the boy lives, the environment is described as "where the Grickle-grass grows and the wind smells slow-and-sour when it blows and no birds ever sing except for old crows" (p. 3), the reader is left to believe the boy lives in a waste land, where everything around him is either dying or in a state of decay which would explain the slow-and-sour description. This would also explain why the only animal that lives at the end of the boy's town is a crow, which is scavenger birds, thus associated with death.

The Once-ler then completes the picture of the area where he lives and the majority of the fable takes place. For instance, the narrator describes Once-ler's home as "cold" and describes the

area where he resides as "dank Autumn nights". The portrayal of the Truffula Valley did not always sound so grotesque or unappealing; before the Truffula trees were cut down, the Once-ler himself decides to reside in this place because of its beauty.

As soon the Once-ler takes his place as a narrator, he starts by describing the Truffula forest as follows:

Way back when the grass was still green
and the pond was still wet
and the clouds were still clean,
and the song of the Swomee-Swan rang out in space...
one morning I came to this glorious place... (Seuss, 1971, p. 14)

Here, not only does the Once-ler let us know he liked Truffula Valley, but that he liked all aspects of its ecosystem including its rich fauna and flora. The Once-ler even goes as far as stating "all my life I'd been searching/ for trees such as these" and how he felt "a great leaping/ of joy in my heart/ I knew just what to do/ I unloaded my car". The Lorax never actually describes the forest other than to warn the Once-ler of the harm he is to do if he keeps cutting down Truffula trees and poisoning the pond where numerous fish inhabited.

C. Analysis of Nature Based on Description for the Reader

The Lorax presents nature in two manners: the first being one of wonder and admiration, a place illustrated with such beauty and majesty no one would be able to deny it. The Once-ler even says so himself, expressing he felt joy when he arrived to Truffula Valley and right there decided to stay. This is rather important because the depiction of nature, or the setting of the story, gives a physical and concrete demonstration of how humans have exploited the natural resources of beautiful places without looking at the consequences. It also depicts how nature can

flourish with the existence of other animals, but because the humans shown in the story are fool of greed, they cannot see a way of having a symbiotic relationship with nature.

The second way nature is presented is from a colonial perspective were an ecosystem, meaning its biotic and abiotic components are looked at as meaningless objects which should be used by humans however and whoever way they like to. For instance, the Lorax went to inform the Once-ler his actions were endangering the Bar-ba-loots,

NOW...thanks to your hacking my trees to the ground,
there's not enough Truffula Fruit to go 'round.

And my poor Bar-ba-loots are all getting crummies

Because they have gas, and no food, in their tummies! (Seuss, 1971, p. 37)

To which the Once-ler reciprocated by expressing that although he was sad

business is business!

And business must grow

regardless of the crummies in tummies, you know! (Seuss, 1971, p. 39)

This could be seen time and time again, when the Lorax continuously warns the Once-ler of the mistake he was making by rupturing a fully functional and sustainable ecosystem. Next came the birds and later the pond, one by one all the animals were gone.

Although one can argue the setting in the Lorax (1971) is not real and therefore one could not create an impact on it, this is not true. Similarly to the Lorax's (1971) setting, there are numerous places that resemble what some people call Truffula Valley, especially because the descriptions of the setting are general descriptions of flora and fauna which could be part of any country during the spring or summer time. However, Dr. Seuss did this purposefully since it would be easier for people to identify with the situation and believe the story could be happening

in an important and special place to the reader as well as the characters. More importantly, the purpose of having such drastic changes in the setting is to make readers aware of how their actions can affect the environment they inhabit as well as showing how much one person can affect the life of other beings.

2. Ecological Literacy

A. How Life is Possible?

The environment the Once-ler describes when he first arrived is more than appropriate for flora and fauna. He described the grass was green, the pond was wet, how the clouds were clear and one could see mile after mile of Truffula trees and smell them in the fresh morning breeze. This description is extremely helpful because it not only describes the place where the once-ler lives but rather because he provides insight as to how the system worked.

By saying this he was unconsciously addressing how much it rained, enough for wildlife to be lush and fruitful. This argument can also be corroborated by the comment "the pond was still wet", which means that the clouds produced enough rain to feed the aquifer with clean water to make up for evaporated water and to maintain its inhabitants and other wild life in great health.

In fact, the pond mentioned in the story is one of the main reasons why this place was inhabitable since it is the only aquifer mentioned in the story, which mean it was the main source of water for all the wild life existed on Truffula Valley. It is also one of the main reasons why the Once-ler describes "mile after mile" of Truffula trees, since the soil that surrounded aquifers are full of mineral and nutrients which make the soil extremely fertile, thus more plant growth and wild life. Another interesting description, which shows how varied the flora in Truffula Valley

was, are the words "the bright-colored tufts of the Truffula trees", which means that not only were there many Truffula trees but there were numerous plant species of the same genus.

The variation of flora would also explain, why the Once-ler chooses one animal from land, air and water to talk about how the ecosystem is later compromised. To represent the land, the Once-ler chooses Brown Bar-ba-loots, which resemble the likeness of a bear, which used the tree for shade and was its main source of food. To represent the air the Once-ler introduces is the Swomme Swans, who lived on top of the Truffula trees, although other information is scarce. While the water animals called Humming fish, lived vigorously in the pond jumping time to time so much so that the Once-ler describes the aquifer as "the rippulous pond" (Seuss, 1971, p. 17), meaning the pond had ripples on its surface even though ponds have tranquil water.

B. Natural Systems and Humans Interact Together

There are two aspects which establish the relationship between human and nature in this fable. The first one is the Once-ler and his family and how they invade Truffula Valley in order to make the Thneed factory. Because of this most of the fauna of the valley is left with no option but to retreat to peripheral areas or to remain within the area a face death by starvation or poisoning by pollution. Therefore it is safe to say the relationship between humans and nature is not good since it is based on the exploitation of nature, from a financial viewpoint as well as a physical.

The second aspect is the moment the little boy receives the Truffula Tree seed. Here the portrayal of nature is left unsaid and therefore taken in by the reader as either positive or neutral position. After the Once-ler tells the story, the child then has to decide if he will allow the tree and nature fall prey to human greed or stand up for it. This open ending is very important because the responsibility transfers from the Once-ler, to the little boy in the book and then to the reader. As a result, the outcome of this relationship is left to be seen in the next few decades.

3. *Literary Ecology*

A. Relationship Between the Geographical Place and Textual Presentation

Although most people believe *The Lorax* is a modern fable and all its components are fictional, this is not the case. Dr. Seuss did not necessarily come up with the animals, plant life and characters, but he did use clues which upon close inspection could give the reader clues as to the stories geographical location and flora and fauna. In other words, although there is no specific place that holds all of the author's description of the setting, some aspects of it that can be found physically in real life. For instance, people tend to believe Truffula trees are just fictional flora created by Dr. Seuss, when in fact Truffula trees exist, however unlike the name suggests, they are actually flowers commonly known Western Pasque Flower (Appendix A).

The Western Pasque Flower, scientifically named *Pulsatilla Occidentalis* or *Anemone Occidentalis*, are native to mountainous areas of California and Montana. It grows approximately 5 to 60 cm., roughly almost two feet. The flower grows in moist meadows during spring and reaches its Truffula like state near September, including its production of a fruit. The *Pulsatilla* genus, counts with 26 different species, which roughly resemble the description made in *The Lorax*, although not to the extent of the Western Pasque.

Much like the description of moist meadows and mountainous areas, the valley illustrated in *The Lorax*, greatly resembles where the Western Pasque flower grows. Because the flowers are native to California, one can assume the author of this fable had seen this flower first hand and was influenced by it since he lived the last 40 years of his life in California. Similarly to the Truffula trees, Dr. Seuss mentioned how the Humming Fish at the pond had to walk out of the toxic water to find a new source of clean water, which is, also true. Although the fish in the book walk on its tail, the majority of walking fish actually use the fins and tails to push themselves up

into dry land. Another fact about this fish, is that most of them can only be out of water for a limited amount of time, which usually ranges from 18 to 24 hours, if absolutely necessary.

B. The Implications of Such Relationships.

Because so many facts from this book are real, one can draw three assumptions. The first would be that the author of the *Lorax* was an individual who was fascinated enough with nature and, nature consciously or unconsciously, made its way to his works of literature. The second assumption would be the scientific knowledge Dr. Seuss had to have in order to write, describe and include facts how closed ecosystems work and the purpose of the flora and the fauna in it. The third and most important assumption would be how by making the setting and its components so intriguing, Dr. Seuss created awareness of how much factual education one can receive from literature and how this can later become a catalyst for future research on behalf of the reader.

Ecology

From an ecological perspective, there are various hints or insights as to what might have happened to the Truffula tree forest. This specific concept of place or location in ecology is called bioregions. Bioregions tend to have unique flora and fauna, which can only be found in that particular location, seeing as to how the text *the Lorax* does not give additional information as to what are the conditions to neighboring environment. However, because ecologists see the Truffula tree forest as a unique ecosystem, the reader has to become mindful that the departure of the animals and the deforestation of the location lead to ecological collapse ^{xxxviii}.

The collapse of the ecosystem came to be because of various factors: first being deforestation of the area. In fact, trees tend to be one of the major factors which contribute to the health of a sustainable ^{xxxix} ecosystem seeing as how they provide shelter to animals as well as

food. Nevertheless, they are vital for the maintaining moisture in the soil and prevent erosion ^{xl}.

Trees also help the soil maintain natural biochemicals and acidity of the soil balance, meaning the soil maintains its ability to grow other types of flora such as shrubs, fungi and flowers.

In addition, rain would wash away the sediments and pollute the water systems, hence, killing the fish in the pond as well as any aquifer that runs underground. The consequences of said event would be dangerous to biodiversity, especially because all water systems feed both flora and fauna. Essentially, this would affect the whole ecosystem seeing how there would be an over-population of larva, algae, insects and death of multiple animals like birds and bears, since they would eat the poisoned fish. In fact, something like this is taking place nowadays. i.e. Fish, especially tuna, have unhealthy amounts of mercury or other biochemicals that are both deadly for the fish as well as predators.

Education

From an educational perspective, *The Lorax* (1971) has very complex implications as to how reckless humankind's behavior has proven dangerous to other animals. The most prominent, or rather, the most noticeable being the departure of the animals from one location to another. If the reader takes into consideration the act of endemic ^{xli} animals leaving the Truffula forest, we must consider the fact all the animals mentioned in the book—Bar-ba-loots, Swamee-swams, and the Humming fish—were renouncing from the location readers may consider as place. This forced migration is down played; readers tend to forget or misinterpret the significance of these acts of it of the wording used. For instance, the Lorax sends them off, sends them away and in search of clear waters which implies the animals will not be as affected by the dramatic change of environment. The tone of these words also imply, animals act like human beings and are able to leave a place by simply deciding upon it.

However, it is up to the reader to decide whether the animals in the story are given human attributes, as characterized by fables, and, therefore, a sense of identity, place and a voice. It is this the case then the act of leaving stops being a fact/objective/ concrete and becomes metaphorical. This then sets up a set of questions, which change the way readers view the story and ultimately the impact it may have upon them such as how did the decision of leaving come to be? How willing were the animals to leave? Did any of them stay? If so, what happened to them? Who convinced the animals to leave? Did they surrender their land to the Once-ler? Did the animals own land in the first place? Why did the Once-ler not talk to the animals personally?

If the animals in the fable have some physical attributes, then what are they? Why does the Lorax have to speak for them? Who and what is the purpose of the Lorax? Why is he important? Why did the animals let themselves be oppressed? And more importantly, why did the animals not stand together and over throw the Once-ler? This perspective is fascinating because the outlook is a metaphor for social and political situation in which animals are being colonized or overpowered by a tyrannical government. It also means the animals were part of a dictatorship and possibly a purge^{xlii}, which is possibly an extremist or fascist^{xliii} government.

This interpretation also means the animals underwent a disassociation with the location in which they lived in, thus no longer holding the name of place—since the location has no significance to them—and went through a period of change and placelessness^{xliv}. This is especially true for the generation born in the second location because these individuals feel no connection to their place of origin other than a location were the parents were born at. The Truffula forest, then, stops being a place, holding any relevance to the animals other than a location, hence scientific geography^{xlv}.

On the other hand, if the animals are not given human attributes, and looked upon in a realistic manner, one has to wonder how did leaving come to be? Were the animals being driven out of the forest one by one as development took place or were they all displaced^{xlvi} at such a rapid pace they all had to migrate at the same time? How long did development take in order to cut down the whole forest? Were the animals allowed access to the development land and its resources? What happened to the animals during said time? Did the animal and human populations increase or decrease during the time of development? If so how did this affect the animal's behavior? How did humans react to said change?

If this is the view people perceive of the situation, the issue is rather ethical since the animals were either thought as lesser beings in two different ways. The first being, animals are somewhat vulnerable to society but not enough for humankind to go out of their way and try to stop or change industrialized human behavior and culture since it would mean a core/ideological/ethical and philosophical change in their beliefs and way of life. The second view would be an anthropocentric standpoint, in which humankind decides— directly or indirectly reject or surrender responsibility of the Other—to let the animals deal with their new reality on their own while they take over and exploit the location the animals inhabited. This view is rather cruel but ultimately comes down to the belief that animals are less important than humans and therefore acceptable for humans to hurt or mistreat them.

On the other hand, if readers consider the departure of animals to be symbolic, then it is safe to say two outcomes can be considered. The first being the animals are making a symbolic departure from the physical location, meaning they were never able to recover or inhabit the development of the land thus walking away from it in search of a new place that could support their survival. The second is a much darker one, seeing as how their departure could be a

symbolic representation of death, therefore, the journey from the physical world to a more abstract metaphorical one.

Needless to say, all these possible interpretations are important, not only because they determine the meaning and significance of the story of the reader, but also because it determines the way they think. Although, most people would object to these views at first glance, one has to understand the readers has to interpret everything they encounter and their way of life, culture and their way of thinking. Similarly, it is important to clarify that most individual's way of thinking branches out from education while their experiences and the way in which they are interpreted are products of formal and informal education which mixes with the cultural and social beliefs to create and identity or persona.

Philosophy

In the case of *the Lorax* (1971), the little boy goes through a pilgrimage with the objective of identity exploration and purpose. Through the text, the reader is able to see the character goes out of his way to search for an event or place that calls to him. Similarly to the Once-ler, the boy decides to wonder unto the unknown and discovers how other's actions and realities may be close to his. Unlike the people of the town who live relatively close to the Once-ler, as seen in the texts images, the child realizes the only way he can learn about others and how he is influenced by them, is by exploring the unknown: the Once-ler. One can come to this conclusion because the boy had come to the Once-ler with the snail and fifteen cents. More importantly, because the child goes through the telling of the Once-ler's story with an open mind. As a result, the boy is able to overcome judgement or resentment towards the Once-ler and take action upon the emotional and physical wasteland he lives in. It is this brief moment after

the story is done, one can say, the boy internalizes he is an agent of change. The boy becomes aware he can start transforming his reality, and thus the circumstances of the collective.

In the same way to the Once-ler, the boy discovers he is not going to change everyone's mind, which in itself, is not the purpose at the moment. His purpose is to better the environmental or physical conditions while telling his story and becoming a moral and ethical catalyst for others to experience. By doing so, the boy is able to overcome social and cultural boundaries such as being overlooked by others his age, being seen as ignorant or of little power.

The boy's task is not to convert people to his ideology but to be a testament to those who are able to see that taking action is more important than remaining dormant. Nonetheless, the boy's purpose does not mean he becomes a guru or a hero, but rather an individual who is able to understand the consequences of humankind's behavior more clearly than others. Consequently, he becomes, of his own volition, an agent of moral consciousness of a community and of a nation by breaking a seemingly endless cycle of judgment and stagnation.

Nausicca of the Valley of the Wind

Nausicca of the Valley of the Wind (2004) is a manga, or Japanese comic, written by Hayao Miyazaki. The series consist of nine volumes published intermittently from 1982 to 1994. These comic books where later translated into English by Toren Smith and Dana Lewis in 1982 and published the same year were it recieved world recognition as one of Miyazaki's masterpieces. The first sixteen chapters were later made into a movie, under the same title, directed by Miyazaki himself.

This story follows the life of Nausicaa, a princess of a small kingdom who lives in a futuristic post-apocalyptic Earth where the life of humanity is endangered by a bioengineered poisonous forest which threatens to take over the open land. This forest is protected by the Ohmu, a creature who was engineered to guard the land from growing human populations after being exploited by an industrial society for centuries until the land is once again fertile.

Because there are very few places where it is safe to live, the protagonist faces the challenge of saving her kingdom from incoming attacks and invasions from other humans, keeping peace with the poisonous forest and the creatures that inhabit it as well as trying to find a way to create harmony between humans and their environments

Components, Principles and Aspects.

1. Ecological Criticism.

A. Community.

There are various communities present in *Nausicca Valley of the Wind* (2004), both in Volume One and Volume Two, which for the most part keep appearing over the course of the two-manga volumes. However, the most prominent communities, in the Japanese comics are those which the characters themselves call kingdoms. These kingdoms occur as a result of the

human-engineered toxic forest, to which gatherings of people settled in different geographical locations they themselves deemed best in terms of protection.

The most important or prevalent kingdoms are the Valley of the Wind Kingdom, ran by Nausicaa's father and the princess herself. This kingdom prided themselves of staying away from the war of other kingdoms and of having little to no threats from the toxic forest since the geographical location allowed the wind to maintain the dangerous spores from the forest away from them. Because the land had little to no toxic waste or spores near it; the kingdom had a strong relationship with its ecosystem and agriculture. In fact, it was the only kingdom which made any effort to work with nature instead of against it or simply to exploit it. This, of course, is because Princess Nausicca had an amazing understanding of nature and what other might call an unnatural connection to all the life forms that inhabited this ecosystem.

The second community mentioned is the kingdom of Tolmekia, ran by Princess Kushana, after her father's death. Little is mentioned about this kingdom other than it came to invade the valley of the wind in order to gain the Giant Warrior who could destroy the poison forest and the animals that protected it. However, it is mentioned the Tolmekian princess had brought war to every kingdom while searching for the Giant Warrior, and she had killed thousands of people to show her authority and her warrior-like cunningness. While the third community explored is the kingdom of Pejjin, known because of its industrial tendencies. Although Pejjin is mentioned a few times they are mostly to speak of the royal twin siblings or because the kingdom was in turmoil because of war.

B. Language (Interpretation Through the View Point of the Character).

The only direct perspective on nature the reader gets is from Princess Nausicaa, who adores to be in nature and is fascinated with how nature looks for new ways to recover from the

destruction humans had laid upon hundreds of years before Nausicaa's existence, back at the pinnacle of the industrial era. In fact, there are a few events which mark her connection to different flora and fauna of the ecosystem she is part of. For instance, in Volume One, we see the character multiple times being in contact with the toxic forest and its guardians while admiring the beauty of its destructive force. It was this dualism which intrigued her the most, since she could both see the beauty and purposefulness of the guardians of the forest while feeling sad and burdened by all the lives which had been lost because of it, including the lives of many Ohmu.

The second experience in Volume One which expresses the understanding Nausicca had with the Ohmu is when the plane which had some villagers of the valley of the wind had crashed into the poison forest and she goes after them. During the explosion of the airplanes above the toxic forest, the creatures who protected it become agitated making the Ohmu come to her to investigate if the humans posed any danger to the area. While the villagers prepared to fire their weapons, Nausicaa offered herself to the Ohmu so they could see that not all humans were violent creatures. During this interaction, the Ohmu touched her to sense if she had altering intentions to which she complies by saying "please... understand... We're not your enemies". After the encounter the Ohmu leave and the villagers are left with the task of looking for a way to go back to their village to prevent war.

The next experience which allows readers to see Nausicaa's connection to animals is when she was still a child, and again her parent's wishes and the safety of her kingdom, she had taken a baby Ohmu from its mother and wanted to keep it as her companion. However, it is because of her close connections with Ohmus since childhood she could feel at peace with them and around them unlike other people who opted to destroy the creatures because they feared them. This environment is later mimicked after Princess Nausicaa transports a hurt Ohmu

youngling back to its herd, where the princess is elevated into the air and has a vision. The Princess experiences this vision in a dream-like-state as the Ohmu come together and place their feelers in the air create a healing light which resembles the fields where the princess played with the baby Ohmu when she was a child, as a way to show their gratitude for saving one of their own. After this scene, Nausicaa stands up in what she thinks is a "gold field", which in fact are the Ohmu feelers, and cries when she is led down by the Ohmu to real physical ground. She then expresses her appreciation for these creatures by hugging the Ohmu youngling the Pejjin soldiers had injured.

C. Analysis of Nature Based on Description for the Reader

In Volume One, nature is represented from a romanticized view point, mostly because of Princess Nausicaa. Because of this, readers are constantly presented with the idea that nature is beautiful, dynamic and complex, thus being encouraged to give in to human curiosity. As a result, this curiosity then turns into a need for understanding; the reader is presented with the option to feel fascinated by nature as a passive spectator or encouraged to actively study nature scientifically like Nausicaa did. However, in the second volume, nature is represented mostly as a destructive force which had to be eliminated in order for the human race to flourish. This is especially true for the fauna, which presented the largest challenge for humans, since the spores released by the toxic forest could kill thousands of people in a small amount of time. For instance, after visiting a place infected by toxic spores, villagers had to clean and sanitize anything that came in contact with it because one spore could infect the place where people had settled. As a result, nature is presented as a thriving force which is also hostile, destructive, treacherous, volatile and fatal.

The change of the physical setting and its components makes a big difference in how readers see nature and how it influences the characters. The reason for this is because the forest is presented to us in the first volume as a separate area to the place where humans live. Although for most people, the notion of humans being separate from nature is normal; the implications of it are not positive. Because people find themselves to be separate from nature, this could create a rupture in the way humans in general treat nature and their actions toward it, including a sense of superiority over nature and later on the need to prove this sense of superiority by controlling nature and its components. However, in the second volume of the comic, the toxic forest and the animals who protect it are seen as invasive, thus changing the way in which both the characters and the reader perceive nature, since nature no longer is part of the environment that encompasses the area where humans live but as a threat to human existence and survival.

Because the view of nature as being invasive is predominant in most cultures, people tend to take a colonial perspective on it. By this, I mean humans take nature as something which must be destroyed, colonized or destroyed in order to preserve their way of life. As a result, many plants, animal and whole ecosystems have been altered to either fit to contemporary society or simply taken out of its native origin. For instance, humans have genetically engineered food to make it bigger in size, to have a larger quantity or made food adaptable to different temperatures, in order to suffice human consumptions without thinking about the consequences this could have on how it affects people, animals, plants and planet Earth as an enormous ecosystem.

2. Ecological Literacy

A. How life is possible?

The environment is appropriate for life since the climate is appropriate as well as water, soil and air are present during the course of the two volumes. In fact, both comic volumes show

an array of polarized environments in the same area such as desert-like-plains and plains at close proximity to abundant tropical-like habitats. However, it is important to point out the narrator expresses how the industrial civilization had “plundered the soil of its riches, fouling the air and remolding the life forms at will”. This is of great importance since the narrator implies although, life was possible, it would look and behave different than what contemporary society might know today because of the circumstances in which the flora and fauna come to be.

More importantly, the comic presents how the fauna is able to grow in the forest, but not outside of it. The reason for this is not given to the reader but at closer inspection and revision, one can see that the water outside of the toxic forest was acidic while the water within the forest was purified. As a result, the reader can later come to realize extreme environments (desert plains and tropical forests) work together because of underground water systems.

The wildlife presented in the book is numerous and varies greatly depending on the environment the character is in. For instance, the first time we met Nausicaa she is exploring the toxic forest and how the animals who lived there formed part of this closed ecosystem, even those who had died. During this exploration, the reader sees the vast majority of the flora that are part of the toxic forest, from small dandelion-like-plants to tall-plants that resemble palm trees in shape. More importantly, during the time of exploration the princess takes a moment to look at the life cycles of plants and the way in which they reproduced, taking some samples of the spores they released with her for further analysis. Interestingly enough, the flora presented in the comic resembles that of the Carboniferous period of the Paleozoic Era in appearance, although they are not in a humid tropical-like area.

The first two volumes of the comic do not specify as to how the animals reproduce and what they live of, however, it is important to point out how insects are like the Ohmu need water

(within the toxic) jungle to live in as well as to drink. In addition, the fauna portrayed in the comic is very primitive, but demonstrates an abundant array of animals that make the story seem surreal and at some point could even make the reader believe that the comic no longer takes place on Earth, but on another planet. For instance, the reader is shown numerous giant flying insects which resemble contemporary millipedes, moths and dragon flies with stingers very much like those found in the late Carboniferous period as well as a variety of land animals like giant isopods and beetles and other land insect like those found in the Pennsylvanian period during the Paleozoic Era. These animals are shown to live deep in the toxic forest in the comic and hardly come out unlike the Ohmu.

B. Natural Systems and Human Interaction

The interaction between humans and nature in both comic volumes is rather complex because humans separate themselves from nature, thus nature will be given different names according to human relationship. For instance, human interaction with domesticated nature is presented at the Valley of the Wind, where villagers were accustomed to grow their own food and integrate nature, although domesticated, to their daily lives. This is also the case for animals, who had a "good" relationship with humans as long as they were domesticated and presented no threat to humans. However, it is also important to point out that this relationship is not healthy in nature because it is the result of a hierarchical and colonial mindset where animals are treated as inferior beings.

Comparatively, the second kind of interaction is that in which humans, the toxic jungle and its inhabitants came together. Interestingly enough, nature was negatively involved both actively and passively towards humans. What I mean by this is that there are passive interactions where nature is used as a setting humans use to fight each other; as a result, the idea that nature is

a violent or hostile environment is reinforced. Conversely, the interactions between human and nature tend to be violent and result in acts of attacking or killing, either nature towards humans or humans towards nature. This is because the flora and fauna were engineered to allow the planet Earth to heal itself, the animals and plants are bigger and deadlier. The reason for this is to keep humans at bay so that they are not able to stop or reverse the regeneration the planet was doing in order to clean itself from the pollution humans had done to the planet for hundreds of years in its industrial era.

3. Literary Ecology.

A. Relationship Between the Geographical Place and Textual Presentation.

One of the major aspects of *Nausicaa of Valley of the Wind* (2004), is how the story is set on Planet Earth, a thousand or so years after the industrial era. However, the comic book does not give a precise place where it unfolds other than Euroasia. Because of this, the relationship between the geographical space and the textual representation is much more ambiguous and general. Nevertheless, the way in which the planet Earth is portrayed is rather accurate to what contemporary society has knowledge of in terms of the accurate climate, inhabitants, environments and ecosystems.

At the same time, it is important to point out Miyazaki did his best to make the flora and fauna in the comic match the geographical place since the majority of the animals and depictions of the planets ecosystem are in fact creatures that resemble those found in the Paleozoic Era. More precisely, Hayao Miyazaki influences the flora and fauna from the Pennsylvanian and Carboniferous period.

B. The Implications of Said Relationship

There are a few implications as to why and how Hayao Miyazaki used nature in *Nausicaa of the Valley of the Wind* (2004). The most important one being how nature is used to reflect the character and mindset of a person; by this I mean, if the person is ecologically mature and capable enough to have a peaceful existence with nature as well as recognizing they themselves are a part of nature. Another aspect Miyazaki shows the reader is how humans (as a collective) tend to destroy or eliminate anything they fear or disapprove of. As seen in the comic, most of the characters tend to destroy nature not because it existed, but because they found it troublesome to coexist with wildlife that was unpredictable which turned into fear or hatred towards nature.

This is of great significance because for once Miyazaki puts into perspective how the mindset of capitalist-industries and the people who live by these circumstances tend to think. Miyazaki puts events in such a way that help the reader realize how petty the characters were by wasting a ridiculous amount of time concentrating on destroying nature rather than finding a way of living beside it or coexist. The purpose of these two books is not seeing how nature is evil, or even how we related to nature, but rather how we are blinded by our own ego and dismiss the fact that we ourselves are nature. Nature will never succumb to mankind's pride because nature is not only around us but above all nature is within us.

Ecology

The narrator describes Earth as a sterile wasteland before Nausicaa's birth; this phenomena is known as ecological collapse. That is to say, the soil was not able to achieve or maintain its biological balance in order to sustain its flora and fauna. In fact, most ecologists believe planet Earth works as a sustainable ecological system, which functions on a macro level

which interconnects smaller ecosystems. It is because of this notion, learners need to keep in perspective the cause and effect occurrences like deforestation affect all ecosystems on Earth as a whole. As a result, events like this tend to take decades, if not centuries, to reverse its effects depending on the extent of the damage the land suffered.

The act of wildlife revitalization in this sort of situation is known as primary succession, which means the progressive replacement of one community by another until a community is established. The process can occur naturally, through the passage of time, or artificially, by reestablishing the balance in the soil and introducing flora and fauna in order to help the process of purification. Although, this artificial process has proven to work in cases of mining, mostly of precious metals and may take decades to reestablish a function and sustainable ecosystem. Even so, the reestablished ecosystem will behave or function in the same way it had previous to the disaster.

Education

Unlike the *Lorax* (1971) and *Little Red Cap* (1999), *Nausicaa* presents the aftermath of an industrialized capitalist society in which greed has led to the collapse of Earth's ecosystems as well as human civilization as contemporary society knows it. That is to say, from an educational perspective, *Nausicaa* presents an ethical dilemma of how humankind has used and abused natural resources. This ethical dilemma relies on questions like how long did it take humankind to see the consequences of an ecological collapse? Did the ecological collapse occur in specific countries or all over the world? If so, how bad was the damage done? Was it reversible without the use of bioengineering flora and fauna? Who decided to create and use bioengineered flora and fauna? Did any country try one of these methods? Which countries approved this? Were

countries with little political power taken into consideration? How did such decision affect humankind's relation to nature?

The dilemma of how the kingdoms in Nausicaa were divided along with its natural resources is left in the air as well as the significance a location has for each kingdom. For instance, Nausicaa's kingdom can be considered a place, but the invading kingdom seems to possess little to no attachment to the land. This sort of situation makes one ask if all kingdoms were nomads or semi-nomads? If so, how does this affect their relationship with nature? Did they feel any type of attachment for their kingdom besides a physical representation of power? What were they looking for in other lands in terms of resources? As a result, this type of situation presents an ethical dilemma as well as a political one, since different countries will fight each other for natural resources.

Philosophy

Nausicaa's journey to awareness was by far the most complex what out of the other text because she had already internalized the notion of oneness with nature. The secondary characters in the text made allusion to Nausicaa's closeness to nature several times. In fact, the community was in constant awe of Nausicaa's view of life and actions. More importantly, the kingdom saw this connection as a gift or an extraordinary skills and depended upon her to protect the community against nature. Nausicaa's quest towards awareness is based on understanding and acceptance.

Unlike *Little Red Cap* (1999) whose type of awareness is recognition of self as an individual, or the boy in *Lorax* whose awareness is transformation of the self and society, Nausicaa's pilgrimage is creating a bridge between humankind and nature. Hence, the place and time in which she lived in nature and humankind's sociocultural and political notions were

separable, thus parallel realities/ existences. This parallel existence was to remain separate, at all cost, until they would inevitably merge and create chaos by and to humankind's societal notions.

Miyazaki's portrayal of human nature is one controlled by instinct, emotion and socioeconomic conditions. In fact, hereditary and environmental factors do more to influence and shape characters than experiences themselves. For instance, Nausicaa feels responsible to help the community in which she lives in because she is a princess, however, she decides to help her community both politically and scientifically by studying nature. Nevertheless, humankind has alienated themselves from other animals on the notion they are the only beings capable of emotion and rationality. This is reflected through human language—specifically the ones used in capitalized and industrialized societies—which conglomerate all type of life forms other than humans as it. Doing so does not only alienate humans but reflects the standpoint of the Other, as a lesser, hence, its value is negotiable. The value of the objects or biological life is given upon each case depending on the necessity humans have for it or how difficult it is to obtain it.

Regardless, nature is the absolute truth since it is the only facet of reality which humans have no utter control of. Humankind's quest for the discovery of the self is not only a physical representation of domination over nature but of emotional and spiritual submission to that which goes beyond humankind senses. Therefore, understanding nature and our place in it becomes a conscientious experience.

Chapter 5: Thematic Unit

We discovered that education is not something which the teacher does, but that it is a natural process which develops spontaneously in the human being.

—*María Montessori*

These lesson plans are examples of how one can integrate ecology to the English ESL curriculum following a content-based instruction. It should be made clear these activities are examples and by no means the only way of integrating ecology into the classroom.

In addition, it is important to point out that each discussed text thus far will be assigned to two lessons, which will be distributed into Ecology and Human Ecology. The idea behind this premise is to make learners aware of the differences between the two, while exposing them to new situations where curiosity for learning, individual research and group sharing is encouraged and celebrated.

Another important aspect of these short thematic units is giving key activities that will give way for learners to see the text in a new light while giving them enough time to acquire and internalize the information given as well as make connections to themselves, to the text and to the world.

Lesson Plan Template

1. Compatible with Curriculum Map Unit:

2. Topic:

3. Big Picture:

4. Academic purpose:

5. General Strategy:

E.C.A Phase: Exploration Conceptualization Application

Reading Trilogy Phase: Before During After

6. Curriculum Connection: Spanish Science Technology
 Physical Education Agricultural Science

7. Expectations:

8. Depth of Knowledge:

Recall (I) Skill/Concept (II) Strategic Thinking (III) Extended Thinking (IV)

9. Operational Objectives: Throughout several activities the student will be able to:

Conceptual:

Procedural:

Attitudinal:

10. Activities:

Initial:

Development:

Closing:

11. Materials:

Little Red Cap

Lesson One

1. Compatible with Curriculum Map Unit: 6.1- Characters Facing Challenges

2. Topic: Human Ecology- Stop, Think and Listen

3. Big Picture: EQ1. How do challenges lead to new learning?

4. Academic purpose: Show students realize the importance a setting has upon a character and how the students themselves are influenced by place, to break away from negative misconceptions of nature, to simplify learning and creating literature as well as to get students to experience the power of telling a story through their eyes.

5. General Strategy:

E.C.A Phase: Exploration Conceptualization Application

Reading Trilogy Phase: Before During After

6. Curriculum Connection: Science

7. Expectations:

6.S.2c Answer and formulate both closed and open-ended questions in both formal and informal discussions.

6.S.5 Describe and explain experiences, ideas, and concepts using appropriate grammar and vocabulary, adjusting language choices according to purpose, task and audience.

6.W.8 Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a variety of discipline-specific tasks, purposes, and audiences.

8. Depth of Knowledge:

Recall (I) Skill/Concept (II) Strategic Thinking (III) Extended Thinking (IV)

9. Operational Objectives: Throughout several activities the student will be able to:

Conceptual: During class students will look at their notes and create an outline in order to create a narrative about their experiences of nature.

Procedural: Student write reflective journal about their experiences with nature.

Attitudinal: Get students to think critically about what they have been taught about Nature and changing their negative perceptions of nature by creating positive experiences.

10. Activities:

Initial: Students should answer some questions to find out what they think of nature and what type of experiences had led them to enjoy or dislike being in it. How much time do they spend in direct contact with Nature? What has been their experience of Nature in the Educational system? Is there any particular literary work that makes you think of Nature? Do you think Nature Writing is relevant to you?

Development: Students should pick an outdoor location (within the selected area) where they feel comfortable. Instruct them to look closely at Nature and do free writing about it. Students should write for 10 to 15 minutes. Students experience nature at their own pace. Encourage their curiosity.

Closing: After the activity is over give learners a few minutes so they are able to write their observations. Ask students what stood out the most for them about the experience? What were they thinking about during the activity? Did their point of view of Nature change after the activity?

11. Materials: Notebook.

Lesson Two

1. Compatible with Curriculum Map Unit: 6.2 - Non-Fiction Study: Challenges Facing Communities

2. Topic: Ecology- Now and Then

3. Big Picture: EQ1. How do challenges lead to new learning? EQ4. Why is written expression important?

4. Academic purpose: To create mindfulness of the animals the learner's fear the most and how this fear can be overcome by getting to know more about this animal.

5. General Strategy:

E.C.A Phase: x Exploration x Conceptualization x Application

Reading Trilogy Phase: ___ Before ___ During x After

6. Curriculum Connection: x Science x Technology

7. Expectations:

6.L.1a Listen attentively, stay focused, ask/answer detailed closed and open-ended questions, express appropriate reasons, and begin to express opinions or to clarify positions using complete sentences and correct grammar.

6.S.4 Negotiate with or persuade others in conversations using grade-appropriate vocabulary, as well as open responses, to provide and support counter-arguments.

6.R.10 Read and comprehend literature from Puerto Rico and other cultures, including stories, dramas, and poetry, and informational texts (e.g., history/social studies, science, and technical texts) of appropriate complexity.

6.R.9I Integrate information from several informational texts on the same topic in order to write or speak about the subject knowledgeably.

6.W.2 Write longer informational texts to examine a topic and convey ideas with increasing independence using appropriate text organization, grammar structure and spelling.

8. Depth of Knowledge:

__Recall (I) __Skill/Concept (II) __Strategic Thinking (III) __ Extended Thinking (IV)

9. Operational Objectives: Throughout several activities the student will be able to:

Conceptual: How characters overcome fears and used said knowledge as a learning experience.

Procedural: Find their scientific name, common name, geographical location and its place in nature. Students should research said animal, its behavior and place in nature.

Attitudinal: Changing student's perspective of fear or disgust of an animal because of its behavior or appearance.

10. Activities:

Initial: Name animals that you most dislike, find repulsive or weird looking.

Development: Students should be able to write a reflective paragraph on their opinions of this before and after research.

Closing: Getting students to make a connection towards animals people fear and how they are treated or looked upon.

11. Materials: Notebook, computer with internet connection or Encyclopedia.

Lorax, The

Lesson One

1. Compatible with Curriculum Map Unit: 6. 3: Non-Fiction Study: Newspapers and Current Events

2. Topic: Human Ecology- Degradable vs. Non-degradable.

3. Big Picture: EQ1. How do challenges lead to new learning? EQ4. How can I learn more about what is going on in my community and the world?

4. Academic purpose: Exploring some of the problems learners face with pollution on a personal. Students will also explore this dilemma as a collective within their community.

5. General Strategy:

E.C.A Phase: x Exploration x Conceptualization x Application

Reading Trilogy Phase: ___ Before ___ During x After

6. Curriculum Connection: x Science x Technology x Agricultural Science

7. Expectations:

6.L.1a Listen attentively, stay focused, ask/answer detailed closed and open-ended questions, express appropriate reasons, and begin to express opinions or to clarify positions using complete sentences and correct grammar.

6.S.4 Negotiate with or persuade others in conversations using grade-appropriate vocabulary, as well as open responses, to provide and support counter-arguments.

6.R.3I Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text.

6.W.8 Write routinely over extended time frames (time for research, reflection, and

revision) and shorter time frames (a single sitting or a day or two) for a variety of discipline-specific tasks, purposes, and audiences.

6.LA.1a Use pronouns (including intensive pronouns) correctly and ensure they are in the proper case (subjective, objective, possessive).

8. Depth of Knowledge:

__Recall (I) __Skill/Concept (II) __Strategic Thinking (III) __ Extended Thinking (IV)

9. Operational Objectives: Throughout several activities the student will be able to:

Conceptual: Explain concepts degradable and non-degradable in terms of human consumption and waste management.

Procedural: Students will write a reflective journal and share it with fellow classmates.

Attitudinal: Change the way in which students view waste and act upon it.

10. Activities:

Initial: Students should find 5 examples of degradable and non-degradable items.

Development: After collecting samples, students should answer the following questions:

What did I find? Where did you find it? Is this item biodegradable or is it non-degradable? How long does it take item to decompose by itself?

Closing: Students will share findings and write a reflective journal on it.

11. Materials: Notebook.

Lesson Two

1. Compatible with Curriculum Map Unit: 6. 3: Non-Fiction Study: Newspapers and Current Events

2. Topic: Ecology- Biodiversity Mapping

3. Big Picture: EQ1. How do challenges lead to new learning? EQ3. Why are details in a text important?

4. Academic purpose: Show students the importance of biodiversity and the impact it has on multiple ecosystems.

5. General Strategy:

E.C.A Phase: Exploration Conceptualization Application

Reading Trilogy Phase: Before During After

6. Curriculum Connection: Science Technology Spanish

7. Expectations:

6.R.3I Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text.

6.W.8 Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a variety of discipline-specific tasks, purposes, and audiences.

8. Depth of Knowledge:

Recall (I) Skill/Concept (II) Strategic Thinking (III) Extended Thinking (IV)

9. Operational Objectives: Throughout several activities the student will be able to:

Conceptual: Students should be introduced to domesticated and undomesticated

animals.

Procedural: Students should be able to write a small expository journal explaining animals found in the community and compare notes with other students.

Attitudinal: Students should recognize the difference between domesticated animals and non-domestic ones. However, they should be able to empathize with both and become less fearful of the unknown.

10. Activities:

Initial: The students will be allowed to roam assigned areas for 10 to 20 minutes. While doing so students should look for five (5) examples of non-domesticated animals examples of non-domestic animals within their community.

Development: After students have recovered their data they should be able to pick three of the five examples. Students will research and answer the following questions: What animals did you find? Where and how long does it live? What does it eat? What does it contribute to its ecosystem? Does any of this animals appear in the text?

Closing: Students should be able to make a compare and contrast between the animals in his/her community and those found in their main literary text or news article.

11. Materials: Notebook, computer with internet connection or encyclopedia.

Nausicca of the Valley of the Wind

Lesson One

1. Compatible with Curriculum Map Unit: 6. 4- Memoirs: Exploring Personal Challenges

2. Topic: Human Ecology- Human vs. Nature design.

3. Big Picture: EQ1. How do challenges lead to new learning? EQ2. Which experiences are worth writing about?

4. Academic purpose: Making students aware how humans design their creations, what materials are used and if the production of their creation is sustainable.

5. General Strategy:

E.C.A Phase: x Exploration x Conceptualization ___ Application

Reading Trilogy Phase: ___ Before ___ During x After

6. Curriculum Connection: x Science x Technology x Agricultural Science

7. Expectations:

6.L.1 Listen and interact with peers during group participation and oral presentations.

6.S.1 Contribute to class, group, and partner discussions by following turn-taking, asking relevant questions, affirming others, adding relevant information, and paraphrasing key ideas.

6.S.2b Express self using correct, simple, compound, and complex sentences.

6.S.5 Describe and explain experiences, ideas, and concepts using appropriate grammar and vocabulary, adjusting language choices according to purpose, task and audience.

6.W.3 Write descriptive and narrative paragraphs to develop real or imagined experiences or events using effective technique, details, structure, and using transitional words and other cohesive devices to better organize writing.

8. Depth of Knowledge:

__Recall (I) __Skill/Concept (II) __Strategic Thinking (III) __ Extended Thinking (IV)

9. Operational Objectives: Throughout several activities the student will be able to:

Conceptual: Students should be introduced to new technological creations that use biomimicry to make a more sustainable community.

Procedural: Students should point out the similarities in shapes, patterns and textures as well as their function and how each item affects nature and humankind.

Attitudinal: Get students to think critically about how nature's designs could be innovative to humans and how they can benefit from it.

10. Activities:

Initial: Find five examples from each category, both nature and man-made. Pick two objects from opposite categories and compare color, shape, size texture, patterns and functions.

Development: Students should brainstorm ways of incorporating elements of each category and how it would translate into the opposite category. i.e compare man-made inventions and how some of its elements can be translated into nature and vice versa.

Closing: Students should answer the following questions: How would this new item work? What would be its purpose? How would the item be replace? By who? How?

11. Materials: Notebook, nature and man-made samples.

Lesson Two

1. Compatible with Curriculum Map Unit: 6. 3: Non-Fiction Study: Newspapers and Current Events

2. Topic: Ecology- Nature journal

3. Big Picture: EQ2. What is considered newsworthy? EQ4. How can I learn more about what is going on in my community and the world?

4. Academic purpose: Getting students to understand how important the diversity of flora is for animals and humans as well as exploring present in our communities.

5. General Strategy:

E.C.A Phase: Exploration Conceptualization Application

Reading Trilogy Phase: Before During After

6. Curriculum Connection: Science Technology Agricultural Science

7. Expectations:

6.S.2 Respond orally to closed and open-ended questions.

6.R.3I Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text.

6.R.4I Determine the meaning of academic and content-specific words and phrases in an informational text.

6.LA.1 Demonstrate command of English grammar and usage when writing (e.g., various sentence types such as compound, complex, and simple) or speaking.

8. Depth of Knowledge:

Recall (I) Skill/Concept (II) Strategic Thinking (III) Extended Thinking (IV)

9. Operational Objectives: Throughout several activities the student will be able to:

Conceptual: Students should know general knowledge of flora native to Puerto Rico and how the use of flora was used in Nausicaa to emphasize a humankind's conflict with nature.

Procedural: Students will research information on plants and create a journal with samples.

Attitudinal: Changing student's perspective on the purpose of flora, especially disproving the purpose that plants are not only important for their beauty.

10. Activities:

Initial: Students will go on an outing on an assigned area and find five samples of plants in their community.

Development: Studying samples and answering the following questions: What is the name of the plant? Where did it come from? In what environments did it thrive on? Who discovered it? When? How? Does this plant still thrive in the wild? What impact have humans have on this plant? Does the plant have any survival or defense mechanism? Do any animals nourish from plant? How does this plant contribute to continuity of its ecosystem?

Closing: Students should record and share gathered information with classmates.

11. Materials: Notebook, computer with internet connection or encyclopedia.

Chapter 6: Conclusion

Thus "the problem of the environment," which many people persist in viewing as a peripheral arabesque drawn around the "important" concerns of human life, must ultimately be seen as a central philosophic and ontological question about the self-definition of contemporary man.

—Harold Fromm

The aim of this study was to create and develop ecological conscious lesson plans using *Little Red Cap* (1999), *The Lorax* (1971) and *Nausica of the Valley of the Wind* (2004) in English for the sixth graders of the existing curriculum in Puerto Rico. This research project may serve teachers, college professors, college students and individuals who are interested in teaching English as well as those who would like to integrate ecological or environmental topics in the classroom. Furthermore, this study may be of interest for those who are involved in incorporating Content based instruction as well as individuals who are interested in featuring mediums of popular culture to their lessons. This research project also provides educators with the specific criteria used to evaluate the books analyzed and how it can be reproduced with other literary material as well as lesson plans to enhance learner's knowledge on ecology.

In this study, the difference between environmental and ecological are explained with the purpose of making humankind's connection to nature less anthropocentric and dualistic. Consequently, ecological education seeks to provide students scientific based knowledge to create a more holistic and cohesive educational instructions. Although, ecology is used to create mindfulness towards human's interconnectedness to nature, it is not used as a way to solve our current ecological crisis. Instead, this field is used as a method to transcend social, cultural, political and academic boundaries with the aim understanding how nature works and learning from it.

Because the possibilities of fusing ecology to different subject matters, this research project uses three components – ecological literacy, ecological criticism, and literary ecology—in order to analyze nature in children's literature. Ecological Literacy focuses on the environmental conditions depicted in the text to see if life is possible, how an ecosystem works and how humans interact with said ecosystem in the text. Ecological Criticism focuses on building an academic community of literary exchange, looking at language with the means of analyzing the description of nature made by characters and analyzing nature found in the text. While Literary Ecology focuses on analyzing textual representations of nature to actual geographical location and getting to know the geographical location the story takes place in, its ecosystems and the wildlife which inhabits such location. In addition, *Little Red Cap* (1999), *The Lorax* (1971) and *Naussica of the Valley of the Wind* (2004) will also be observed from Dewey's hands-on pedagogy, Freire's critical thinking pedagogy and Gorossberg's popular culture pedagogy in order to help its learners build their own understanding and knowledge of the world through experience and actions.

After analyzing these three texts, one can postulate the problem with our current ecological crisis is not the fact that the world around us is changing, but rather that human beings, their society and culture, live in a state of mind, created an illusion where everything is permanent, stoic, unchangeable and, therefore, limitless. However this is not true, we live in a planet which is dynamic; its different properties are full of variety, creativeness and constant adaptation. Because of this, it is the place of formal education to provide learners with different skills to adapt to the changes that occur on Earth.

Although it is important for people to admire nature from an aesthetic standpoint, it is crucial to understand that nature without its wildlife is just a landscape, something we can only

look at but not experience. Instead, each individual must teach others every aspect of nature has its purpose and is interconnected to all properties of biological life. Humans like nature, and all its properties, are catalysts of change. We must never forget how actions and words can affect an individual's character to the core as well as their existence. Therefore, education must start teaching people, especially children, that nature is not a commodity; we depend on it as any other property of Earth's ecosystem. Essentially, the purpose of ecological education is not only to point out humankind's mistakes but rather make them aware of their errors, show them possible ways to transform society through actions and exercise these changes in each individual's community.

Pedagogical Implications

Moving towards a Reconstructivist approach requires educators to make their classroom student-centered. It also requires educators to teach learners how to think critically so they are able to deconstruct and reconstruct literary texts in order to reshape their notions of nature and culture. Likewise, educators have to reflect on the manner and topics introduced in the classroom while taking into account learner's previous knowledge, background and interests.

Introducing ecological topics through literature provides students a different manner to learn the English language without placing emphasis on Puerto Rico's sociopolitical involvement in the language. It also offers learners a new way of looking at literature when examined through different cultures and literary genres. In addition, it offers educators lesson plans with engaging activities and easy-to-find materials with the objective helping students accomplish critical thinking, research and improve literacy.

Limitations of Study

Because environmental and ecological topics are still being introduced to the existing curriculum in Puerto Rico, many of the challenges ecological education will face will be preparing educators to learn about ecology and incorporating this knowledge to their English class. Consequently, most of the individuals who will receive significant education on ecology will be learners who attend schools which specialize on science or agriculture. Similarly, most of the educators who will be easily able to incorporate ecological topics in the classroom will have to create an academic culture within their community so learning occurs in and outside of schools.

In addition, this study was not presented or applied in an English classroom and, therefore, is unable to be more specific on the learners' need and knowledge on ecology. Because of this, ecological education only brings into perspective the theoretical facet the study. In order to prove this project's effectiveness, multiple trials must be done through the years and with different populations to determine to what extent the study must be modified.

Suggestions for Future Research

One way of developing ecological education can be through the use of popular television programs such as *Once Upon a Time*, *Grimm* and *Lost*. This can be done by analyzing the way in which nature is portrayed and looked at from the character's perspective and their interactions with their environment. This will also serve as a bridge between popular culture and formal education since popular television programs will maintain learner's attention while providing different cultural views, beliefs and ideologies about nature. Moreover, looking and analyzing popular movies such as *Brave*, *Wall-e* and *Frozen*, can also be a possibility since they show unique humankind vs. nature conflicts. Both television and movies can be studied from a

character, place or plot developing perspective to see the way in which characters change their view upon nature depending on the challenges and experiences they are faced with.

Final Thoughts

After going through the process of analysis in each text from an ecological, educational, philosophical and literary perspective, I now realize the work of an educator is much more complex than the general notion of it. I recognized one of the problems educators face is connecting to learners from a sociocultural level while trying to satisfy learner's curiosity and interest in everything outside the parameters of formal education. Similarly, evaluating texts to use in the classroom can be a daunting task for educators, especially if their schools have limited materials to work with, rendering the task of finding useful books unbearable. This is especially true for teachers who are trying to introduce topics which are new to them because of the limited resources they may have on said topic.

Educators also face the challenge of having to comply with the curriculum established by the department of education while providing students new and dynamic mediums to learn and practice a language. Because of this, educators tend to feel overwhelmed or apprehensive about the use of popular culture within the classroom while trying to find materials to enhance critical thinking. As a result, educators tend to rely on using and reusing the same materials which in the long run hinders the educator's teaching effectiveness and the learner's acquisition of knowledge.

In addition, I realized making students aware their actions not only affect them, but those around them, is nerve wracking since the line between encouraging and oppressing an individual is fairly thin. For this reason, learners should be exposed to materials and environments where

they are encouraged to exchange ideas, experiences and knowledge. Expectantly, this will help students understand they are agents of change.

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Footnotes

ⁱ Fixed objective coordinates on Earth's surface. E.g. 18.4500° N, 66.1000° W

ⁱⁱ Place is how we make the world meaningful and the way we experience the world. Place, at the basic level, is space invested with meaning in the context of power. Places are defined and reshaped by experience (Cresswell, 12).

ⁱⁱⁱ Unicellular organisms lacking a nucleus, possessing distinctive ribosomes and initiator tRNA, and generally containing peptidoglycan in the cell wall. Different bacterial groups are distinguished primarily on nucleotide sequence data.

^{iv} Plural for Archaea. Unicellular organisms lacking a nucleus and lacking peptidoglycan in the cell wall. Once grouped with the bacteria, archaeans possess distinctive membrane lipids.

^v A major group of archaeans diagnosed on the basis of rRNA sequences. Includes many methanogens, extreme halophiles, and thermophiles.

^{vi} biotic and abiotic components of life.

^{vii} American essayist, poet and novelist who led the 19th century Transcendentalist movement. Mainly known for works like *Nature*, *Self-Reliance* and *The American Scholar*.

^{viii} American author, philosopher and transcendentalist. He is mostly known for his book *Walden*, a memoir of spiritual growth found through nature by isolating himself from 19th century industrialized culture and society.

^{ix} American writer and lecturer, whose real name is Samuel Langhorne Clemens. His most notable works are the *Adventures of Tom Sawyer* and its sequel the *Adventures of Huckleberry Finn*.

^x American novelist, journalist and short story writer, which focus on social criticism. His most famous works are the *Call of the Wild* and *White Fang*.

^{xi} Scottish-American naturalist, activist and author. He is famously known for creating awareness towards nature; specifically advocating the preservation of American wilderness known today as American National Parks such as Yosemite National Park and the Sequoia National Park. He was also the founder of the Sierra Nevada club, an environmental organization founded in 1892, in San Francisco California (Ken Burns, National Parks).

^{xii} The most prolific of the three newspapers sold nationwide in Puerto Rico. News are written and published only in Spanish and sold daily for 55 cents. The newspaper can be accessed online at endi.com and through mobile devices without any charge.

^{xiii} The original text reads as follows: La tendencia a que las escuelas respondan a las demandas sociales se acentúa sobre todo en la modernidad, en el cual la naturaleza de la producción y del trabajo requiere el desarrollo de ciertas capacidades o competencias; es decir, conocimientos, destrezas y actitudes, que solo la educación formal es capaz de proporcionar (Proyecto de Renovación Curricular, 25).

^{xiv} Hayao Miyazaki is a famous Japanese film director, animator, manga artist, illustrator, producer and screenwriter. He is also the co-founder of Studio Ghibli, where most of his manga creations are featured. He is considered to be the greatest Japanese animation director to date; his success often compared to that of Walt Disney. He has won over 40 awards for his films, including an Oscar for Best Animated Feature in 2003 for *Spirited Away*.

^{xv} Concept discussed in *Pedagogy of the Oppressed*, in which Freire expresses how education is viewed from a perspective where “knowledge is a gift bestowed by those who consider themselves knowledgeable upon those whom they consider to know nothing” (Freire Institute). This type of education, therefore, oppresses children since they are looked at as empty vessels

that could not contribute anything of worth to education or society unless they are mechanically drilled with knowledge.

^{xvi} It is not enough for people to come together in dialogue in order to gain knowledge of their social reality. They must act together upon their environment in order critically to reflect upon their reality and so transform it through further action and critical reflection.

^{xvii} Term used by Freire in *Pedagogy of the Oppressed* to explain open communication between members of a community. As Freire points out, "it is not enough for people to come together in dialogue in order to gain knowledge of their social reality. They must act together upon their environment in order critically to reflect upon their reality and so transform it through further action and critical reflection" (Freire Institute).

^{xviii} Codification is a way of gathering information in order to build up a picture (codify) around real situations and real people (Freire Institute).

^{xix} Decodification is a process whereby the people in a group begin to identify with aspects of the situation until they feel themselves to be in the situation and so able to reflect critically upon its various aspects, thus gathering understanding. It is like a photographer bringing a picture into focus (Freire Institute).

^{xx} Language becomes the medium to convey informational content of interest and relevance of the learner (Brown, 55). Likewise, Larsen-Freeman explains, using content from other disciplines in language courses (132).

^{xxi} Any close relationship between species, including mutualism, commensalism or parasitism.

^{xxii} Focuses on climate change, species extinction, population and growth or loss of forest.

^{xxiii} "is an interdisciplinary and trans-disciplinary study of the relationship between humans and their natural, social and built environments" (Miriam Webster). That is to say, making a

correlation between the natural world and how it is affected by human activity by making multidimensional connections an individual has to his/her surroundings.

^{xxiv} Manga can be used to identify any graphic novel that mimics the style of creators from Japan, although in translation manga is simply the Japanese word for print comics. In the United States, manga means comics originating from Japan, whereas in Japan manga means everything in the format no matter the country of origin (Brenner, 257).

^{xxv} "A core component of Friedan theory is that learner so begin with action is then shaped by reflection, which gives rise to further action. Learning is thus a continuous process, directed at enhancing the learner's capacity to act in the world and change it."

^{xxvi} Language becomes the medium to convey informational content of interest and relevance of the learner (Brown, 55). Likewise, Larsen-Freeman explains, using content from other disciplines in language courses (132).

^{xxvii} Hit single by the British band Duran Duran. The song was produced by Colin Thurston for the album *Rio*. The song was released in May 1982 as the band's fifth single in the United Kingdom (Wikipedia).

^{xxviii} Song by American rock band Evanescence, written by its lead singer Amy Lee and Terri Balsamo. Call Me When You're Sober peaked at number 10 on the *Billboard* Hot 100, number 4 on the *Billboard* Alternative Songs chart, and within the top 20 of several more charts internationally (Wikipedia).

^{xxix} "Lollipop" is a song by Mika from his 2007 debut album, *Life in Cartoon Motion*. Mika, is a Lebanese-British singer and songwriter.

^{xxx} A television program created in 2011 within the genres of drama, fantasy and horror. The series focuses on “a homicide detective discovers he is a descendant of hunters who fight supernatural forces” (IMDB).

^{xxxi} A television program created in 2011 within the genres of adventure, fantasy and romance. The series focuses on “A woman with a troubled past is drawn to a town in Maine where fairy tales are to be believed” (IMDB).

^{xxxii} For the purpose of this research investigation, this concept will mean to be present in all aspects of life, including every day causalities and fleeting moments in natural history

^{xxxiii} In most cases, this concept means all knowing, however, for the purpose of this research investigation it will mean well-informed.

^{xxxiv} Refers to the institutions and groups that most immediately and directly impact the child's development including: family, school, religious institutions, neighborhood, and peers (Wikipedia).

^{xxxv} A text which dealing with the life of shepherds, commonly in a conventional or artificial manner, or with simple rural life generally.

^{xxxvi} A journey, especially a long one, made to some sacred place as an act of religious devotion

^{xxxvii} A type of novel concerned with the education, development, and maturing of a young protagonist.

^{xxxviii} Refers to a situation where an ecosystem suffers a drastic, possibly permanent, reduction in carrying capacity for all organisms, often resulting in mass extinction. Usually, an ecological collapse is precipitated by a disastrous event occurring on a short time scale (Wikipedia).

^{xxxix} Pertaining to a system that maintains its own viability by using techniques that allow for continual reuse.

^{xl} The gradual wearing away of the land surface materials, especially rocks, sediments, and soils by the action of water, glacier or wind.

^{xli} Natural to or characteristic of a specific people or place.

^{xlii} To put to death or otherwise eliminate (undesirable or unwanted numbers) from a political organization, government, nation, etc.

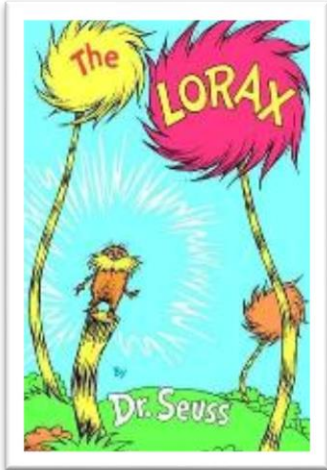
^{xliii} A government system led by a dictator having complete power, forcibly suppressing opposition and criticism, regimenting all industry, commerce, etc., and emphasizing an aggressive nationalism and often racism.

^{xliv} The sense of not belonging or feeling importance for any place.

^{xlv} Activities and forms of human life and culture which threaten regional and place-based distinctiveness. That is to say it points out the increasing diversity of forms of living, with each community becoming recognizably separate (Cresswell, p. 18).

^{xlvi} A lack of home or country.

Appendix A: Western Pasque



Appendix B: Glossary of Terms

- 1) Abiotic: non-living chemical and physical factors in the environment, which affect ecosystems. e.g. Light, radiation, temperature, water, atmospheric gases and soil.
- 2) Aquifer: an underground layer of permeable rock, sediment (usually sand or gravel) or in aquifers are filled with water and are interconnected, so that water flows through them.
- 3) Archaea: plural for Archaea. Unicellular organisms lacking a nucleus and lacking peptidoglycan in the cell wall. Once grouped with the bacteria, archaeans possess distinctive membrane lipids.
- 4) Bacteria: unicellular organisms lacking a nucleus, possessing distinctive ribosomes and initiator tRNA, and generally containing peptidoglycan in the cell wall. Different bacterial groups are distinguished primarily on nucleotide sequence data.
- 5) Banking system: concept discussed in *Pedagogy of the Oppressed*, in which Freire expresses how education is viewed from a perspective where “knowledge is a gift bestowed by those who consider themselves knowledgeable upon those whom they consider to know nothing” (Freire Institute). This type of education, therefore, oppresses children since they are looked at as empty vessels that could not contribute anything of worth to education or society unless they are mechanically drilled with knowledge.
- 6) Bildungsroman: A type of novel concerned with the education, development, and maturing of a young protagonist.
- 7) Biodiversity: diversity among and within plant and animal species in an environment.
- 8) Biological life: the properties or qualities that distinguish living plants and organisms from dead or inanimate matter, including the capacity to grow, metabolize nutrients, respond to stimuli, reproduce, and adapt to the environment.

- 9) Bioregions: an area constituting a natural ecological community with characteristic flora, fauna, and environmental conditions and bounded by natural rather than artificial borders.
- 10) Biotic: living or once-living components of a community. e.g. Organisms such as plants or animals. e.g. Organisms such as plants or animals.
- 11) Closed ecosystem: a self-replenishing ecosystem in which life can be maintained without external factors or outside aid.
- 12) Codification: codification is a way of gathering information in order to build up a picture (codify) around real situations and real people (Freire Institute).
- 13) Concientização: concept coined by Paulo Freire which refers to awareness through the act of dialogue.
- 14) Constructivism: Theory which emphasizes that knowledge is socially constructed, rather than received or rediscovered.
- 15) Content-Based Instruction: Larsen- Freeman argues "it is not exclusively a language program, but instead integrates the learning of a language with the learning of other content" (2011, p. 132).
- 16) Cultural geography: The ranking and classifying of 'culture areas' (these spaces of cultural communication) and an analysis of the ways on which cultural groups affect and changes their natural habitats (Cresswell, p. 17).
- 17) Decodification: decodification is a process whereby the people in a group begin to identify with aspects of the situation until they feel themselves to be in the situation and so able to reflect critically upon its various aspects, thus gathering understanding. It is like a photographer bringing a picture into focus (Freire Institute).

- 18) Desertification: the transformation of a land once sustainable for agriculture into deserts. Desertification can result from climate change or from human practices such as deforestation and overgrazing.
- 19) Dialogue: term used by Freire in *Pedagogy of the Oppressed* to explain open communication between members of a community. As Freire points out, "it is not enough for people to come together in dialogue in order to gain knowledge of their social reality. They must act together upon their environment in order critically to reflect upon their reality and so transform it through further action and critical reflection" (Freire Institute).
- 20) Displaced: A lack of home or country.
- 21) Ecological collapse: Refers to a situation where an ecosystem suffers a drastic, possibly permanent, reduction in carrying capacity for all organisms, often resulting in mass extinction. Usually, an ecological collapse is precipitated by a disastrous event occurring on a short time scale (Wikipedia).
- 22) Ecology: "is an interdisciplinary and trans-disciplinary study of the relationship between humans and their natural, social and built environments" (Miriam Webster). That is to say, making a correlation between the natural world and how it is affected by human activity by making multidimensional connections an individual has to his/her surroundings.
- 23) Ecosystems: a system formed by the interaction of a community of organisms with their environment.
- 24) Endemic: Natural to or characteristic of a specific people or place.
- 25) Environment: the air, water, minerals, organisms, and all other external factors surrounding and affecting a given organism at any time.

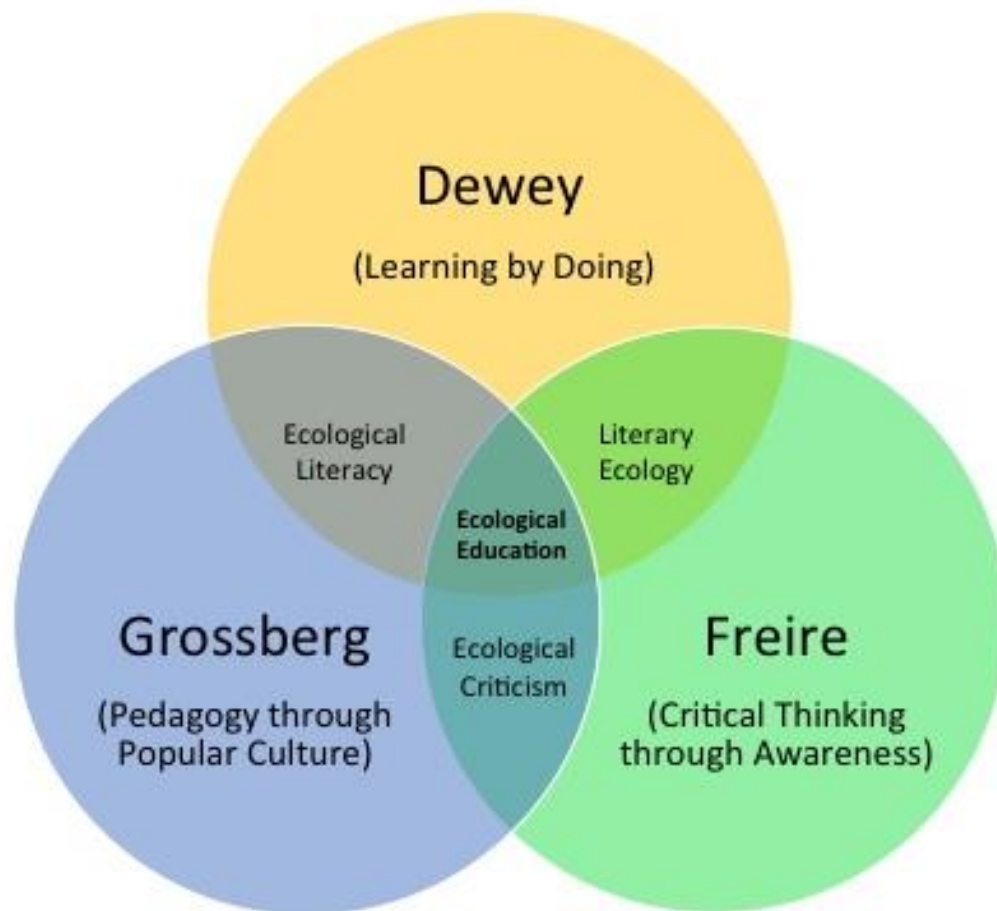
- 26) Environmentalism: focuses on climate change, species extinction, population and growth or loss of forest.
- 27) Erosion: the gradual wearing away of the land surface materials, especially rocks, sediments, and soils by the action of water, glacier or wind.
- 28) Eukaryotes: a major group of archaeans diagnosed on the basis of rRNA sequences. Includes many methanogens, extreme halophiles, and thermophiles.
- 29) Fable: a short tale to teach a moral lesson, with animals or inanimate objects as characters.
- 30) Family: a group of organisms ranking above a genus and below an order.
- 31) Fascism: A government system led by a dictator having complete power, forcibly suppressing opposition and criticism, regimenting all industry, commerce, etc., and emphasizing an aggressive nationalism and often racism.
- 32) Fauna: the animals of a particular region or time period.
- 33) Flora: the plants of a particular region or time period.
- 34) Genus: a group of organisms ranking above species and below a family.
- Green: The metaphor "green" has been adopted as a way of indicating environmentally conscious political positions... Green has been naturalized as a metaphoric representation of nature and environment, a metaphor in need of reclamation. We must, for instance, also take into consideration that "green" can serve other metaphoric purposes, including the understanding that to be green is to be new. (Donbrin, 2011, p. 13)
- 35) Habitat: the area or natural environment in which an organism or population lives.
- 36) High Culture: Nealon defines it as values that are not tied down by time, place or set of cultural values (2003, p. 66)

- 37) Human Ecology: Miriam Webster defines it as “an interdisciplinary and trans-disciplinary study of the relationship between humans and their natural, social and built environments”. That is to say, making a correlation between the natural world and how it is affected by human activity by making multidimensional connections an individual has to his/her surroundings.
- 38) Landscape: refers to the shape—the material topography—of a piece of land. This may be apparently natural (though few, in any, parts of the Earth's surface are untouched by humans) landscape or it might be obviously human, or cultural, landscape of a city. We do not live in landscapes - we look at them. (Cresswell, p. 10-11).
- 39) Locale: the material for social relations—the actual shape of place within which people conduct their lives as individuals, as men or women, as white or black, straight or gay. It is clear that places almost always have a concrete form (Cresswell, p. 7).
- 40) Location: fixed objective coordinates on Earth's surface. e.g. 18.4500° N, 66.1000° W
- 41) Manga: manga can be used to identify any graphic novel that mimics the style of creators from Japan, although in translation manga is simply the Japanese word for print comics. In the United States, manga means comics originating from Japan, whereas in Japan manga means everything in the format no matter the country of origin (Brenner, p. 257).
- 42) Microsystems: Refers to the institutions and groups that most immediately and directly impact the child's development including: family, school, religious institutions, neighborhood, and peers (Wikipedia).
- 43) Pastoral: A text which dealing with the life of shepherds, commonly in a conventional or artificial manner, or with simple rural life generally.

- 44) Pilgrimage: A journey, especially a long one, made to some sacred place as an act of religious devotion.
- 45) Place: place is how we make the world meaningful and the way we experience the world. Place, at the basic level, is space invested with meaning in the context of power. Places are defined and reshaped by experience (Cresswell, p. 12).
- 46) Placelessness: the sense of not belonging or feeling importance for any place.
- 47) Pollution: the contamination of air, water, or soil by substances that are harmful to living organisms. Pollution can occur naturally, for example through volcanic eruptions, or as a result of human activities, such as the spilling of oil or disposal of industrial waste.
- 48) Popular Culture: Grossberg expresses "popular culture is more than ideological: it provides the sites of relaxation, privacy, pleasure, enjoyment, feeling good, fun and passion" (p. 79).
- 49) Praxis: "A core component of Friedan theory is that learner so begin with action is then shaped by reflection, which gives rise to further action. Learning is thus a continuous process, directed at enhancing the learner's capacity to act in the world and change it."
- 50) Primary succession: the progressive replacement of one community by another until a community is established.
- 51) Purge: To put to death or otherwise eliminate (undesirable or unwanted numbers) from a political organization, government, nation, and more.
- 52) Reconstructivist: This ideology involves recombining or recontextualizing the ideas arrived at by the philosophy of deconstruction, in which an existing system or medium is broken into its smallest meaningful elements and in which these elements are used to build a new system or medium free from the strictures of the original (Wikipedia).

- 53) Scientific geography: Activities and forms of human life and culture which threaten regional and place-based distinctiveness. That is to say it points out the increasing diversity of forms of living, with each community becoming recognizably separate (Cresswell, p. 18).
- 54) Sense of place: the subjective and emotional attachment people have to place (Cresswell, p. 7).
- 55) Soil: the loose top layer of the Earth's surface, consists of rock and mineral particles mixed with decayed organic matter (humans), and capable of containing water, providing nutrients for plants, and supporting a wide range of biotic communities.
- 56) Space: A place available for a particular purpose.
- 57) Sustainable: Pertaining to a system that maintains its own viability by using techniques that allow for continual reuse.
- 58) Symbiotic: any close relationship between species, including mutualism, commensalism or parasitism.
- 59) Transcendence: going beyond ordinary limits; surpassing; exceeding.

Appendix C: Visual representation of Thesis



Appendix D: News Article- Sueña en grande un pequeño agricultor (29 Sept 2013)

Sueña en grande un pequeño agricultor

José Esteban López aspira a crear una escuela agrícola para niños de su pueblo

domingo, 29 de septiembre de 2013 - 10:46 PM

ADJUNTAS – Los juegos electrónicos y la música urbana pudieran cautivar a cualquier niño de 10 años, pero ese no es el caso de José Esteban López Maldonado. Él vive enamorado de su finca y los frutos que en ella cultiva.

“Me gusta la agricultura porque sin ella no hay frutos y sin frutos no hay vida”, subrayó el pequeño de piel trigueña y pelo azabache.

José ama la tierra. También la música típica y la que interpreta con su cuatro entre las apartadas montañas del barrio Limaní, en Adjuntas, donde su padre le obsequió cinco cuerdas de terreno para que las cultivara.

Carmelo López, padre de José y quien trabajó de vendedor en una joyería, se encarga de las restantes cuerdas que poseen, todas en el sector Helechales.

José tiene tres empleados que le ayudan en las faenas agrícolas mientras él estudia el quinto grado en la escuela Francisco Pietri Mariani, a pocos pasos de la finca. Siembra café, plátanos, guineos, chinas y guayaba. Gran parte de ellos los vende en un mercado agrícola que realiza la Universidad de Puerto Rico, recinto de Cayey.

El pequeño agricultor disfruta recoger café. Se cuelga un balde plástico del cuello y, cuando no tiene clases, se interna en su sembradío. La recompensa llega cuando se sube a la guagua de papá para vender los sacos con café.

Otra parte de los granos los retiene para venderlos bajo la marca Hacienda Lírica. El nombre lo sacó de su amor por la música, en especial, el trinar de los pájaros y la poesía.

“Mi hijo tiene unas ideas que a mí, con 40 años en la agricultura, no se me habían ocurrido”, expresó el orgulloso padre mientras recorría la finca. El pequeño aseguró que uno de sus sueños es exportar café.

La familia de José vive en el barrio Vegas Abajo, en el área urbana de Adjuntas, pero José prefirió que lo matricularan en la escuela más cercana a su finca, a poco más de 30 minutos de su hogar. La intención, explicó, era que al salir de la escuela pudiera incorporarse a las tareas agrícolas. Y así lo hace.

El sueño de este niño es ser agrónomo. También quiere estudiar arquitectura. José, quien recibió terapia del habla, es parte del Instituto de Niños Dotados. A su corta edad ya ha tomado cursos de la UPR, en Cayey.

Aida Iris Maldonado, madre de José y quien es cosmetóloga, explicó que le ofrecieron adelantarle dos grados, pero no lo aceptaron. Esperarán que cumpla los 12 años para que tome el College Board y luego decidirán si lo matriculan oficialmente en una universidad.

José tiene un plan a corto plazo: convertir un plantel abandonado en una escuela de agricultura para menores de 15 años. Asegura que ya tiene 50 niños matriculados. “Quiero que los niños se motiven a coger la agricultura, como si fuera un juego”, dijo.

José espera por gestiones legislativas para que le faciliten el plantel. La escuela tiene cuatro salones, uno de los cuales convertirán en el centro comunal del barrio Limaní.

Mientras, un caballo que recién adquirió el niño, al que bautizó como Canario, lo ubicó en el plantel para reducir la maleza.

En lo que llega ese momento, comenzó a equiparse. Compró decenas de tubería en PVC que usará para las clases de cultivo hidropónico.

Appendix E: News Article- Gobernador recoge café junto a estudiante (2 Oct 2013)

Gobernador recoge café junto a estudiantes

Anuncia que se sembrarán 16,000 cuerdas más

miércoles, 2 de octubre de 2013 - 1:16 PM

UTUADO - Un nuevo impulso a la industria del café de Puerto Rico fue anunciado hoy, miércoles, por el gobernador Alejandro García Padilla, que tras recoger café junto a un grupo de sobre 200 estudiantes, informó que a partir de enero se sembrarán otras 16,000 cuerdas del grano.

La adición de estas siembras, indicó el gobernador llevará a 52,000 el terreno dedicado a la siembra del café y elevará la producción del grano en cerca de 50,000 quintales adicionales. García Padilla adelantó además que este proyecto creará sobre 6,000 nuevos empleos en la agricultura que se comenzarán a reclutar de forma gradual a partir de enero.

“Para este proyecto se otorgarán \$4.2 millones en incentivos de abono a los dueños de los terrenos y caficultores y para asegura el éxito de la cosecha, se contará con el asesoramiento técnico del Departamento de Agricultura”, sostuvo.

El gobernador afirmó que durante los pasados cuatro años la producción de café de la Isla se redujo de unos de 166,000 quintales a poco más de 80,000 quintales al presente. Señaló que con esta producción adicional se estará recuperando buena parte de lo perdido.

García Padilla y su esposa Wilma Pastrana se unieron brevemente a un grupo de 200 estudiantes de escuelas públicas que participaron en el recogido del café. Los alumnos son parte del Programa de Educación Agrícola y miembros de la Organización de Futuros Agricultores.

“Estos jóvenes son el futuro del país y al igual que mi administración, están convencidos que la agricultura no es una apuesta al pasado; que no hay que verla con nostalgia, que la agricultura es una herramienta muy importante para el presente y camino al futuro”, expresó el gobernador.

Asegura no subirá el precio

En su visita al campo, García Padilla aseguró que el café no aumentará su precio, al menos por el momento, luego que el gobierno, a través del Departamento de Agricultura, destinara \$670,000 para los agricultores y beneficiadores del grano con el objetivo de cubrir el alza en sus costos de operación.

“Esos \$670,000 corresponden a un pago de \$10 por quintal base pilado que se le está otorgando a los beneficiadores del café para cubrir los costos de energía eléctrica y de combustible que han aumentado para estas empresas y entonces de esta forma subsanamos un incremento que se ha reportado en este sector”, explicó por su parte la secretaria del Departamento de Agricultura, Mirna Comas.

El gobernador proclamó, a renglón seguido, que “no habrá aumento en el café en góndola”.

Appendix F: News Article- Joya avandona en la montaña (9 Nov 2013)

Joya abandonada en la montaña

La Reserva Natural del Cerro Las Planadas no ha sido protegida como dispone la ley
sábado, 9 de noviembre de 2013 - 12:00 AM

En la Sierra de Cayey, en torno a los márgenes del río superficial más importante de la zona, el río Lapas, y en jurisdicción compartida entre Cayey y Salinas, existe una reserva natural desconocida incluso para muchos vecinos de estos pueblos.

En sus más de 2,000 cuerdas de extensión tiene dos ecosistemas marcadamente distintos e infinidad de riquezas naturales, históricas y culturales, algunas por descubrir.

“En la parte norte (en Cayey) podemos ver bosques de palma de sierra y en el área de Salinas bosques donde predomina la vegetación espinosa y cactus, porque es un área árida”, describió Pablo Martínez, líder comunitario de Cayey.

Martínez residió los primeros 17 años de su vida en el lado norte del bosque. Hace más de una década convocó a vecinos para formar el comité Ciudadanos en Defensa del Cerro Planas y Áreas Adyacentes para proteger la zona natural. El deseo de ver esos tesoros preservados movió al grupo a impulsar la aprobación de la Ley 192 del año 2007, que declaró Reserva Natural el Cerro Las Planadas y la zona comprendida por los barrios Lapa, Pasto Viejo y Cercadillo de Cayey, así como el sector La Yeyesa del barrio Lapa de Salinas.

Pero a seis años de su aprobación, los objetivos de esta ley aún no se han cumplido. Recientemente, la propia secretaria del DRNA, Carmen Guerrero, reconoció la violación de ley.

“Después de años de inacción gubernamental desde que se aprobó la ley para proteger estos terrenos en el año 2007, el Departamento ha retomado la agenda de trabajo necesaria para delimitar los terrenos que integrarán esta Reserva Natural y diseñar un Plan de Manejo y Conservación en conjunto con los municipios de Cayey y Salinas y, sobre todo, con los grupos comunitarios”, expresó Guerrero.

Especies sin descubrir

Martínez señaló que en la reserva se ha encontrado evidencia de al menos tres asentamientos indígenas. Asimismo, aseguró que en la zona hay unas 300 terrazas agrícolas con características poco vistas en Puerto Rico, y restos de varias comunidades de campesinos que vivieron allí hasta los años 70, cuando fueron desplazadas por la falta de carreteras, de servicios básicos o por expropiaciones para construir el expreso entre San Juan y Ponce.

“Es un hábitat importante para especies endémicas, como la boa y la *Alsophis portorricensis* (cobra nativa que caza y mata con veneno que para el humano no es letal), además 33 especies de aves, incluyendo 12 endémicas de Puerto Rico. Encontramos una diversidad de flora y fauna increíble, porque en esa transición de ecosistemas los árboles y las especies de plantas se van adaptando a diferentes climas. De hecho, todavía no hemos determinado cuántas especies de plantas hay, pero calculamos como de 400 a 500 especies de plantas y árboles diferentes”, detalló el líder comunitario.

Por lo pronto, lo más que le preocupa a los vecinos son los saqueos de yacimientos arqueológicos. “Si hay algo importante que hacer (ahora) sería darle seguimiento con los Vigilantes del DRNA”, señaló Martínez.

Vicente Quevedo, botánico y secretario auxiliar de planificación del DRNA, indicó que el cuerpo técnico de la agencia y personal de la Junta de Planificación han estado realizando inspecciones de campo y reuniéndose con líderes comunitarios desde el 2008 para determinar cuáles deben ser los límites de la reserva.

Indicó que se requiere consultar también con el Instituto de Cultura Puertorriqueña (ICP) para incluir los restos de asentamientos indígenas y de comunidades hasta mediados del siglo pasado.

“Falta la adopción de los límites formales por la Junta de Planificación, empezar a trabajar el plan de manejo, establecer si va a ser bajo un enfoque de comanejo, qué participación tendrán los líderes comunitarios en ese comanejo. Si se va a estructurar a base de una junta de comanejo, cómo llevar a cabo y bajo qué modelo de manejo se van a correr los proceso de protección de los terrenos prospectivamente”, anticipó Quevedo.

Appendix G: Unit Descriptions and Pacing Maps

Unit	Name	Description
6.1	Characters Facing Challenges (8 weeks)	Students will read narrative texts about challenges that characters encounter in stories. The student applies reading and vocabulary strategies to help him/her understand what he/she read and he/she uses the writing process to create narrative writings.
6.2	Non-Fiction Study: Challenges Facing Communities (7 weeks)	Students will read expository texts about challenges faced by communities. He/she learns and uses reading and writing strategies specific to expository texts.
6.3	Non-Fiction Study: Newspapers and Current Events (7 weeks)	Students will further explore the genre of non-fiction by studying newspapers and reporting on challenges facing his/her community. He/she examines the differences between fact and opinion through comparing news and editorial articles. The student creates his/her own classroom newspaper publication, complete with news reporting, editorials, and interviews of community or school leaders who are tackling challenges faced by the community.
6.4	Memoir: Exploring Personal Challenges (6 weeks)	Students will explore the genre of memoirs through reading memoirs of individuals who faced challenges in their lives. He/she is introduced to several prewriting strategies as he/she brainstorms ideas for his/her own personal memoir about his/her childhood. The student experiences the writing process in-depth as he/she drafts, revises, and publishes his/her childhood memoirs.
6.5	Exploring Poetry (6 weeks)	Students will analyze how poets express their everyday challenges through their poems. Students will read and write poems about everyday experiences.

		Aug			Sep			Oct			Nov			Dec			Jan			Feb			Mar			Apr			May															
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43		
First Week of School - Introduce Routines and Procedures	6.1 Characters Facing Challenges <i>(8 weeks)</i>																Thanksgiving									Christmas Break									Easter Break									Review and Final Exams Last Week of School School Closure
									6.2 Non-Fiction Study: Challenges Facing Communities <i>(7 weeks)</i>																																			
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Appendix H: Transversal Themes

Cultural Identity	Description		Environmental	Human Ecology	Ecology
	A. 1	Our country		✓	
	A. 2	Our Indigenous Spanish and African roots		✓	
	A. 3	We are Caribbeans		✓	
	A. 4	We are Hispanic Americans		✓	
	A. 5	We respect other cultures		✓	
	A. 6	The wonders of the World		✓	✓

Civic and Ethical Education	Description		Environmental	Human Ecology	Ecology
	B. 1	Solidarity toward ourselves and others		✓	
	B. 2	We need others			✓
	B. 3	We respect the sentiments and ideas of others		✓	
	B.4	We share ideas and sentiments		✓	
	B.5	We appreciate all arts and expressions		✓	

Education for Peace	Description		Environmental	Human Ecology	Ecology
	C.1	We respect others’ differences		✓	
	C.2	We are not equals?		✓	
	C.3	We respect life			✓
	C.4	Importance of consensus in decision making		✓	✓

Environmental Education	Description		Environmental	Human Ecology	Ecology
	D.1	The wonders of nature			✓
	D.2	Protecting our environment is our responsibility			
	D.3	The environment and us		✓	✓
	D.4	We need water, plants and soil	✓		
	D.5	We love and protect animals			✓
	D.6	We love and protect all aspects of nature			✓

Technology and Education	Description		Environmental	Human Ecology	Ecology
	E. 1	The computer		✓	
	E.2	Electronic means of communication		✓	
	E. 3	Electronic games		✓	
	E. 4	Publishing		✓	
	E. 5	Technology gets us closer		✓	
	E. 6	Movies, Television and Radio		✓	
	E.7	Using technology responsibly		✓	

Education for work	Description		Environmental	Human Ecology	Ecology
	F. 1	We work for the well-being of humanity	✓	✓	
	F. 2	Working is our duty		✓	
	F. 3	Jobs you could do in the future		✓	

Appendix I: Ecological Literacy*Ecological Literacy*

The great challenge of our time is to build and nurture sustainable communities – communities that are designed in such a way that their ways of life, businesses, economies, physical structures, and technologies do not interfere with nature's inherent ability to sustain life. The first step in this endeavor is to understand the principles of organization that ecosystems have developed to sustain the web of life. This understanding is what we call ecological literacy.

– Fritjof Capra

What is Ecological Literacy?

Ecological literacy, or eco-literacy, is a term first used by American educator David W. Orr and physicist Fritjof Capra in the 1990s, in order to introduce into educational practice the value and well-being of the Earth and its ecosystems. It is a way of thinking about the world in terms of its interdependent natural and human systems, including a consideration of the consequences of human actions and interactions within the natural context. Ecological literacy equips students with the knowledge and competencies necessary to address complex and urgent environmental issues in an integrated way, and enables them to help shape a sustainable society that does not undermine the ecosystems upon which it depends.

Students understand the natural systems that sustain life on earth and apply the principles guiding ecosystems to help create sustainable human communities.

The following are core aspects of ecological literacy:

1. Principles of Living Systems
2. Design Inspired by Nature
3. Systems Thinking
4. Ecological Paradigm and the Transition to Sustainability
5. Collaboration, Community Building and Citizenship

1. Principles of Living Systems

According to Fritjof Capra, the ecological problems facing society are rooted in a lack of understanding of our place in the web of life. A key part of eco-literacy is reconnecting students to living systems – what educator Linda Booth Sweeney calls developing a ‘connected wisdom’. Living systems are open, self-organizing systems that have the special characteristic of life and that interact with their environment through information and material-energy exchanges. Examples of living systems include the human body, or a forest, or a river, as well as human created organizations, such as communities, or schools.

Connecting students to natural systems provides them with a deep sense of place and an understanding of their local environment. While students are immersed in experiences of the natural world as part of their classroom learning, they discover and study the principles guiding the functioning of natural systems. Appendix A and Appendix B outline two different approaches to describing the principles of living systems, including their dynamic, complex, cyclical nature and their inherent interconnectedness. These principles come from the study of ecosystems and from a growing understanding of the way they have evolved over time. They also draw on the approaches of traditional and indigenous societies, many of whom have thrived for centuries by applying these ecological principles.

2. Design inspired by Nature

The guiding principles and characteristics of living systems serve as a basis for envisioning and designing sustainable communities. Beyond understanding natural systems, ecological literacy is about applying this understanding to the redesign of organizations, communities, businesses, and societies to align with ecological principles. The idea of “design inspired by nature” has become popular through concepts such as *biophilia*, *biomimicry* or *biomimetics*, which involve examining and emulating natural models, systems, processes, and elements in order to solve human problems. According to David Orr, the goal of ecological design is to transform how humans act in the world to provide food, shelter, energy, materials, and seek their livelihood. Ecological literacy asks what people know and how should they learn it, given the limits of the Earth and its systems. It demands that human actions and design conform to how the world works as a biophysical system, and that societies be designed with future generations in mind.

3. Systems thinking

Ecological literacy is also guided by an understanding of systems, or systems thinking, sometimes called holistic or relational thinking. Because a system is a set of interdependent, interrelated parts that make up a complex and unified whole, it cannot be fully understood by analyzing its constituent parts. Ecological literacy involves applying a way of thinking that emphasizes relationships, connectedness and context. For example, we can only understand a songbird by exploring both its own characteristics as well as its interactions with the watershed where it lives. Systems operate on multiple scales, with systems nested within systems – a watershed is a vibrant interplay among species from the tree to the bacteria in the soil. Systems thinking is necessary to understand the complex interdependence and often unpredictable dynamics of ecological systems, social systems, economic systems and other systems on all levels. Ecologically literate students find connections in seemingly disjointed problems, perceive patterns instead of pieces, and design communities based on the interrelatedness of all life.

Science lessons about the water cycle or a food web are building blocks of ecological literacy because they reveal to the student how nature works. Likewise, a social studies unit on a human community (e.g., a family, neighbourhood, region or a country) or a geography lesson on resource management contributes to ecological literacy as soon as the dependence and impact of the human system/community/ region on natural systems is acknowledged and explored as a vital part of the story.

Thinking systemically requires a number of 'habits of mind' as outlined in Appendix C and Appendix D. These habits include seeing the whole of a system rather than snapshots of its parts, looking for patterns and connections, and uncovering and testing assumptions. This also involves a shift in perception, from a focus on parts to a focus on the whole, or from discrete objects to relationships within a system. Two versions of these shifts in perception are captured in Appendices E and F and are at the heart of a broader shift in worldview or paradigm.

4. Ecological Paradigm and the Transition to Sustainability

The dialogue about sustainability is about a change in the human trajectory that will require us to rethink old assumptions and engage the large questions of the human condition that some presume to have been solved once and for all. Genuine sustainability, in other words, will come not from superficial changes but from a deeper process akin to humankind growing up to a fuller stature.

– David W. Orr

Ecological literacy is partly aimed at triggering large-scale social change in how humans live on the planet. Teaching young people that we are part of the natural world is the basis for the shift to an ecological paradigm – a worldview that places humans as embedded in ecological systems rather than perceived as separate, and that recognizes that there are global constraints to the amount of resources we can use and waste we can produce on a finite Earth. As Fritjof Capra notes, “in the coming decades, the survival of humanity will depend on our ecological literacy – our ability to understand the basic principles of ecology and to live accordingly.” This shift to an ecological paradigm is part of a transition to sustainability – meeting human wellbeing while substantially reducing poverty and conserving the planet's life support systems. Sustainability is not just about basic needs and human survival, sustainability is the process to create a vibrant society.

The Center for Ecological Literacy notes:

A truly sustainable community is alive — fresh, vital, evolving, diverse, dynamic. It supports the health and quality of life of present and future generations while living within the limits of its social and natural systems. It recognizes the need for justice, and for physical, emotional, intellectual, cultural, and spiritual sustenance.

This is about the ethics guiding human society, including taking responsibility for the social and environmental consequences of our activities.

Daniel Goleman uses the term 'ecological intelligence' to highlight the need for feedback about whether our activities are having a positive or negative impact on people and ecosystems. He makes the point that there is an urgent need for marketplace transparency and for greater human understanding of the ecological impacts of how we live. New information technologies provide a tool for assessing the sustainability of supply chains and the far-flung impacts of our choices. He notes that “we can, together, become more intelligent about the ecological impacts of how we live – and how ecological intelligence, combined with marketplace transparency, can create a mechanism for positive change.” The exchange of information is only one aspect of this

ecological intelligence – Goleman notes that we also need to draw on our social intelligence to coordinate and harmonize our efforts because of the complex global web of cause and effect.

Ecological intelligence allows us to comprehend systems in all their complexity, as well as the interplay between the natural and man-made worlds. But that understanding demands a vast store of knowledge, one so huge that no single brain can store it all. Each one of us needs the help of others to navigate the complexities of ecological intelligence. We need to collaborate.

- Daniel Goleman

5. Collaboration, Community Building and Citizenship

Ecological literacy is about emphasizing collaboration and partnership as a hallmark of living systems and life. The ability to associate, create links, draw on collective distributed intelligence of many individuals is part of ecoliteracy. Ultimately, sustainability is a community practice.

Ecologically literate students are also community builders and active citizens. An ecological education occurs both within the natural environment and in the local community where students can build relationships and apply their understanding in a real world setting. Ecoliteracy knowledge empowers students to help create a better society and make a difference. Studies have shown that combining civic engagement and ecological literacy creates positive change leaders willing to participate as citizens and engage in creating solutions.

Ecological Literacy in a Global Issues course

The Center for Ecoliteracy suggests the following principles for the integration of ecological literacy:

Ecological literacy is not an additional concept or subject to be added to the content of the course. It may be seen rather as a perspective or way of thinking through which any selected topic or Issue may be viewed.

It is useful to focus on guiding fundamental questions, which may recur and open up conceptual links across disciplines (e.g., science, geography, anthropology, politics, history, the arts, sociology, health).

The conceptual links that tie subjects together help make learning more effective since they lead to learning that is more readily applicable to the real world.

Taking a hopeful, proactive approach and designing learning activities that engage students in potential solutions are important when teaching about environmental issues.

Core competencies for Ecoliteracy

The Center for Ecoliteracy <http://www.ecoliteracy.org/discover/competencies> has developed a set of 'core competencies' to help young people develop and live in sustainable communities. These competencies relate to the head (*learning to know*), the heart (*learning to be*), the hands (*learning to do*) and the spirit (*learning to live together*).

Head (Cognitive)

Approach issues and situations from a systems perspective
 Understand fundamental ecological principles
 Think critically, solve problems creatively, and apply knowledge to new situations
 Assess the impacts and ethical effects of human technologies and actions
 Envision the long-term consequences of decisions

Heart (Emotional)

Feel concern, empathy, and respect for other people and living things
 See from and appreciate multiple perspectives; work with and value others with different backgrounds, motivations, and intentions
 Commit to equity, justice, inclusivity, and respect for all people

Hands (Active)

Create and use tools, objects, and procedures required by sustainable communities
 Turn convictions into practical and effective action, and apply ecological knowledge to the practice of ecological design
 Assess and adjust uses of energy and resources

Spirit (Connectional)

Experience wonder and awe toward nature
 Revere the Earth and all living things
 Feel a strong bond with and deep appreciation of place
 Feel kinship with the natural world and invoke that feeling in others

Teaching ecological literacy often involves the following:

Weaving ecological and systems approaches into the existing curriculum in a coherent way that builds student knowledge over time. (Note: The focus should be on ecological concepts and their relationships to each other – both the big picture and the details – and to the active preservation of the ecosphere rather than incremental inclusion of ecological concepts.) Building teacher capacity in the areas of ecology and systems thinking, Learning from nature through immersion in the real world (nature and communities) and a deep knowledge of particular places, Acknowledgement of place-based and experiential outdoor learning as essential to the cognitive development, health and wellbeing of children, Cultivation of a sense of wonder, creativity and compassion for nature and for community, Transformation of the school into a living laboratory of buildings and processes that teach children about their interconnectedness to nature and their communities, and Linkages to Higher Education resources and schools that allow students to continue the development of their Ecological Literacy.

A list of resources is included following the Appendices to further support curriculum development. This is a relatively new field. It is a rich area to explore and take leadership in shaping Ecological Literacy and in nurturing the next generation of empowered students and sustainable communities.

Appendix A: 12 Living System Principles

Source: **Linda Booth Sweeney** - <http://www.lindaboothsweeney.net/thinking/principles>

There are living systems on all scales, from the smallest plankton to the human body to the planet as a whole. When we understand what constitutes a living system, we see that a family, a business, even a country are also living systems. Here is a partial list of principles related to understanding Living Systems:

Interdependence: A relationship in which each partner affects and often needs the other.

System Integrity: What a system has when all the parts and processes essential to its ability to function are present.

Biodiversity: the variety, complexity, and abundance of species that, if adequate, make ecosystems healthy and resilient.

Cooperation and Partnership: The continual process in which species exchange energy and resources.

Rightness of Size: The proportions of living systems—their bigness or smallness and their built-in limitations to growth—that influence a system's stability and sustainability.

Living Cycles: A cycle is a circular process that repeats over and over, frequently returning to where it began. The water, lunar, sleep and other cycles sustain life, circulate resources, and provide opportunities for renewal.

Waste = Food: When waste from one system becomes food for another. All materials in nature are valuable, continuously circulating in closed loops of production, use, and recycling.

Feedback: Circular processes that create growth or decay by amplifying change (reinforcing feedback) or, foster stability by counteracting or lessening change (balancing feedback).

Nonlinearity: a type of behavior in which the effect is disproportionate from the cause.

Emergent Properties: Behavior that arises out of the interactions within a specific set of parts: the health of an ecosystem or a team's performance, for example.

Flux: The continual movement of energy, matter and information that moves through living systems. Flux enables the living or "open" system to remain alive, flexible and ever-changing. The sun, for instance, provides a constant flux or flow of energy and resources that feeds all living organisms.

The Commons: Shared resources – such as air, water, land, highways, fisheries, energy, and minerals – on which we depend and for which we are all responsible.

Other key concepts related to living systems include: autopoiesis, cognition and learning, networks, the first and second law of thermodynamics, stocks and flows, exponential growth, carrying capacity and ecological footprint.

Appendix B: Center for Ecoliteracy – Ecological Principles

<http://www.ecoliteracy.org/nature-our-teacher/ecological-principles>

Creating communities that are compatible with nature's processes for sustaining life requires basic ecological knowledge. We need, says Center for Ecoliteracy cofounder Fritjof Capra, to teach our children — and our political and corporate leaders — fundamental facts of life:

Matter cycles continually through the web of life.

Most of the energy driving the ecological cycles flows from the sun.

Diversity assures resilience.

One species' waste is another species' food.

Life did not take over the planet by combat but by networking.

NATURE'S PATTERNS AND PROCESSES

Understanding these facts arises from understanding the patterns and processes by which nature sustains life. In its work with teachers and schools, the Center for Eco-literacy has identified several of the most important of these: networks, nested systems, cycles, flows, development, and dynamic balance.



Networks

All living things in an ecosystem are interconnected through networks of relationships. They depend on this web of life to survive. For example: In a garden, a network of pollinators promotes genetic diversity; plants, in turn, provide nectar and pollen to the pollinators. (Could we have some human systems examples here for each pattern?)



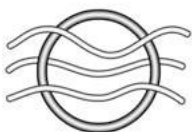
Nested Systems

Nature is made up of systems that are nested within systems. Each individual system is an integrated whole and—at the same time — part of larger systems. Changes within a system can affect the sustainability of the systems that are nested within it as well as the larger systems in which it exists. For example: Cells are nested within organs within organisms within ecosystems.



Cycles

Members of an ecological community depend on the exchange of resources in continual cycles. Cycles within an ecosystem intersect with larger regional and global cycles. For example: Water cycles through a garden and is also part of the global water cycle.



Flows

Each organism needs a continual flow of energy to stay alive. The constant flow of energy from the sun to Earth sustains life and drives most ecological cycles. For example: Energy flows through a food web when a plant converts the

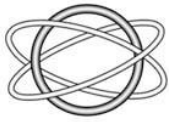
sun's energy through photosynthesis, a mouse eats the plant, a snake eats the mouse, and a hawk eats the snake. In each transfer, some energy is lost as heat, requiring an ongoing energy flow into the system.



Development

All life — from individual organisms to species to ecosystems — changes over time. Individuals develop and learn, species adapt and evolve, and organisms in ecosystems coevolve. For example: Hummingbirds and honeysuckle

flowers have developed in ways that benefit each other; the hummingbird's color vision and slender bill coincide with the colors and shapes of the flowers.



Dynamic Balance

Ecological communities act as feedback loops, so that the community maintains a relatively steady state that also has continual fluctuations. This dynamic balance provides resiliency in the face of ecosystem change. For

example: Ladybugs in a garden eat aphids. When the aphid population falls, some ladybugs die off, which permits the aphid population to rise again, which supports more ladybugs. The populations of the individual species rise and fall, but balance within the system allows them to thrive together.

Appendix C: Habits of Systems Thinkers

Source: **Linda Booth Sweeney:** <http://www.lindaboothsweeney.net/thinking/habits>

There is no one pedagogy, book, or computer program that will help us become better systems thinkers. Instead, the complexity of our worlds demand that we develop “habits of mind” (to borrow Art Costa’s term) to intentionally use systems principles to understand the complexity of everyday situations and to design for desired futures.

The 12 Habits of Mind – a systems thinker...

Sees the Whole: sees the world in terms of interrelated “wholes” or systems, rather than as single events, or snapshots;

Looks for Connections: assumes that nothing stands in isolation; and so tends to look for connections among nature, ourselves, people, problems, and events;

Pays Attention to Boundaries: “goes wide” (uses peripheral vision) to check the boundaries drawn around problems, knowing that systems are nested and how you define the system is critical to what you consider and don’t consider;

Changes Perspective: changes perspective to increase understanding, knowing that what we see depends on where we are in the system;

Looks for Stocks: knows that hidden accumulations (of knowledge, carbon dioxide, debt, and so on) can create delays and inertia;

Challenges Mental Models: challenges one's own assumptions about how the world works (our mental models) — and looks for how they may limit thinking;

Anticipates Unintended Consequences: anticipates unintended consequences by tracing loops of cause and effect and always asking “what happens next?”

Looks for Change over Time: sees today's events as a result of past trends and a harbinger of future ones;

Sees Self as Part of the System: looks for influences from within the system, focusing less on blame and more on how the structure (or set of interrelationships) may be influencing behaviour;






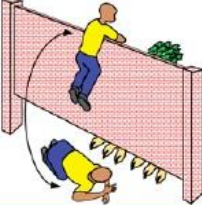








Embraces Ambiguity: holds the tension of paradox and ambiguity, without trying to resolve it quickly;

Finds Leverage: knows that solutions may be far away from problems and looks for areas of leverage, where a small change can have a large impact on the whole system,

Watches for Win/Lose Attitudes: is wary of “win/lose” mindsets, knowing they usually makes matters worse in situations of high interdependence.

Appendix D: Habits of a Systems Thinker

Source: Water Foundation, Systems Thinking in Schools 2007

<p>Seeks to understand the big picture</p> 	<p>Observes how elements within systems change over time, generating patterns and trends</p> 	<p>Recognizes that a system's structure generates its behavior</p> 
<p>Identifies the circular nature of complex cause and effect relationships</p> 	<h2 style="text-align: center;">Habits of a Systems Thinker</h2> 	<p>Changes perspectives to increase understanding</p> 
<p>Surfaces and tests assumptions</p> 		<p>Considers an issue fully and resists the urge to come to a quick conclusion</p> 
<p>Considers how mental models affect current reality and the future</p> 	<p>Uses understanding of system structure to identify possible leverage actions</p> 	<p>Considers both short and long-term consequences of actions</p> 
<p>Finds where unintended consequences emerge</p> 	<p>Recognizes the impact of time delays when exploring cause and effect relationships</p> 	<p>Checks results and changes actions if needed: "successive approximation"</p> 

Appendix E: Center for Ecoliteracy – Systems Thinking: Shifts in Perception

<http://www.ecoliteracy.org/nature-our-teacher/systems-thinking>

Thinking systemically requires several shifts in perception, which lead in turn to different ways to teach, and different ways to organize institutions and society. These shifts are not either/or alternatives, but rather movements along a continuum:

From parts to the whole

With any system, the whole is different from the sum of the individual parts. By shifting focus from the parts to the whole, we can better grasp the connections between the different elements. Instead of asking students to copy pictures of the parts of a honeybee, an art teacher takes her class to the school garden, where they draw bees within the context of their natural setting. Similarly, the nature and quality of what students learn is strongly affected by the culture of the whole school, not just the individual classroom. This shift can also mean moving from single-subject curricula to integrated curricula.

From objects to relationships

In systems, the relationships between individual parts may be more important than the parts. An ecosystem is not just a collection of species, but includes living things interacting with each other and their nonliving environment.

In the systems view, the "objects" of study are networks of relationships. In the school or classroom, this perspective emphasizes relationship-based processes such as cooperation and consensus.

From objective knowledge to contextual knowledge

Shifting focus from the parts to the whole implies shifting from analytical thinking to contextual thinking. This shift may result in schools focusing on project-based learning instead of prescriptive curricula. It also encourages teachers to be facilitators and fellow learners alongside students, rather than experts dispensing knowledge.

From quantity to quality

Western science has often focused on things that can be measured and quantified. It has sometimes been implied that phenomena that can be measured and quantified are more important—and perhaps even that what cannot be measured and quantified doesn't exist at all. Some aspects of systems, however, like the relationships in a food web, cannot be measured. Rather, they must be mapped. In the classroom, this shift can lead to more comprehensive forms of assessment than standardized tests.

From structure to process

Living systems develop and evolve. Understanding these systems requires a shift in focus from structure to processes such as evolution, renewal, and change.

In the classroom, this shift can mean that how students solve a problem is more important than getting the right answer. It may mean that the ways in which they make decisions are as important as the decisions.

From contents to patterns

Within systems, certain configurations of relationship appear again and again in patterns such as cycles and feedback loops. Understanding how a pattern works in one natural or social system helps us to understand other systems that manifest the same pattern.

For instance, understanding how flows of energy affect a natural ecosystem may illuminate how flows of information affect a social system.

Appendix F: System Shifts in Language and Imagery



LINDA BOOTH SWEENEY

Systems Visuals and Narratives

Guiding Heuristics

(Linda Booth Sweeney)

While working with a variety of organizations, I look to make the following shifts – in language and imagery -- wherever possible:

1. SHIFT: Fragments → Wholes (or systems)
Look to reconnect the parts to the larger whole. Knowing that nothing stands alone, looked to shift from isolated focus on people, environmental influences, markets, countries etc. □ interdependence (networks, causal loops).

Key question: How does my ____ fit into the bigger picture?

2. SHIFT: Discrete information → Closed Loops
Look at how seemingly discrete information (in bullet point lists for instance) may be interconnected in closed loops of causality.

Key question: How are the points (or pieces of information) connected?

3. SHIFT: Static/Event-focused → Dynamic/Complex¹
Look for recurring patterns of behavior (archetypes) and ways to harness complex dynamics, for example, by enhancing reinforcing feedback and counteracting balancing feedback.

4. SHIFT: Linear → Non-linear
Look at ways that effects (or consequences) are not always proportionate to actions. (Keep in mind that in living systems, solutions may be far away from problems and leverage may be found in a small change -- or several small changes -- that can have a large impact on the whole system.

5. SHIFT: Own Perspective → Multiple Perspectives
Look at ways to include and represent multiple perspectives to increase understanding.

¹ SHIFT:

Short-term → Long-term. This includes awareness of time delays... when we don't understand time delays, we over-steer and over-correct. Imagine a shower stall. Turning hot and cold water on too fast. Over-mixing paint.

6. SHIFT: Mechanical → Living Systems

Wherever possible, look to shift from mechanical metaphors (static & predetermined) to living systems metaphors (dynamic & changing). For example, we can shift from talking the mechanics of an organization, to the ecology of an organization.

7. SHIFT: Reduction → Synthesisⁱ

Look to set analysis within the context of a deeper understanding of systems properties and behaviors.

8. SHIFT: Problem-solving → problem definition

Look to expand emphasis on defining the problem (including opportunities to “make the system visible) by identifying and depicting how multiples causes, effects and unintended impacts interact.

9. SHIFT: Outside Looking In (exogenous) → Inside Looking In (endogenous) Look for within system influences 10. SHIFT: Either/or □ Both/And

Watch for dichotomous thinking that says it has to be “either/or” to shift to “both/and” that allows for multiple influences (and some ambiguity)

¹ For centuries, Western minds have privileged analysis over synthesis. In school, we were taught that the best way to understand a subject was to analyze it or break it up into parts. Here's how it goes: chop up the big thing into small, understandable parts. Then, put the whole thing back together to understand the behavior of the whole. To write an essay, for example, we were taught to break it down into its component parts: the introduction, the purpose, the body with supporting facts and the conclusion. However, as social scientists and anyone else who is paying attention has observed, analysis-reliant approaches have not measured up when faced with dynamic, complex, sets of relationships that result in a faltering economy, global warming, increasing social inequity and escalating global violence. What needs to happen? Analysis must be contextualized within a deep understanding of systems properties and behaviors. We need to shift to recognize, as many post-Einstein scientists have done, that the universe, and everything in it, is a system whose workings can only be understood in relation to each other and to the whole.

Ecological Literacy Resources

Ecological Literacy

Michael K. Stone and Center for Ecoliteracy, **Smart by Nature: Schooling for Sustainability** (Watershed Media, 2009)

Michael K. Stone and Zenobia Barlow (eds.) (2005) **Ecological Literacy: Educating Our Children for a Sustainable World**, Sierra Club Books.

David W. Orr – <http://www.davidworr.com/>

Ecological Literacy (SUNY Press, 1991) - <http://www.davidworr.com/books.html>

Frijof Capra - <http://www.fritjofcapra.net/>

Books – The Web of Life; The Hidden Connections: A Science for Sustainable Living; Uncommon Wisdom – <http://www.fritjofcapra.net/bibliography.html>

Videos – Ecological Literacy Part 1: <http://www.youtube.com/watch?v=vohcled-kto>

Ecological Literacy Part 2: http://www.youtube.com/watch?v=7RZ-_C3sIt4 Ecological Literacy Part 3: http://www.youtube.com/watch?v=7RZ-_C3sIt4

Daniel Goleman, Ecological Intelligence (Broadway Books, 2009)

<http://danielgoleman.info/topics/ecological-intelligence/>

Alan R. Berkowitz, Mary E. Ford, and Carol A. Brewer. **A framework for integrating ecological literacy, civics literacy, and environmental citizenship in environmental education** - in, Johnson, E.A. and M.J. Mappin (eds.), Environmental Education or Advocacy: Perspectives of Ecology and Education in Environmental Education. Cambridge University Press. New York. pp 227-266.

Hoelscher, David W. "**Cultivating the Ecological Conscience: Smith, Orr, and Bowers on Ecological Education.**" M.A. thesis, University of North Texas, 2009.

<http://digital.library.unt.edu/ark:/67531/metadc12133/m1/>

Systems Thinking

Linda Booth Sweeney – www.lindaboothsweeney.com

Peter Senge, , Nelda Cambron-McCabe, Timothy Lucas, Bryan Smith, Janis Dutton, and Art Kleiner, **Schools that Learn: A Fifth Discipline Fieldbook for Parents, Educators and Everyone who Cares about Education** (Doubleday, 2000).

Peter Senge – **Why change is so challenging for schools: An interview with Peter Senge**

<http://www.learningforward.org/news/jsd/senge223.cfm>

Donella Meadows

“Leverage Points: Places to Intervene in a System” (1999) Hartland, VT: The Sustainability Institute.

The Global Citizen (Island Press, 1991)

Thinking in Systems (Chelsea Green Publishing, 2008) - edited by Diana Wright

Pegasus Communications - <http://www.pegasuscom.com/> **The Resilience Alliance** -

<http://www.resalliance.org>

Society for Organizational Learning - <http://www.solonline.org> **Creative Learning Exchange**

– <http://www.clexchange.org/>

On-Line Courses/Listserv (L. Booth Sweeney: <http://www.lindaboothsweeney.net/resources>)

The Waters Foundation - <http://www.watersfoundation.org/webed/> - offers first-class, web-ed tutorials focused on systems thinking in K-12 education.

Systems Thinking World , offers a Systems Thinking World Discussion Group, free on-line webinars and more -

http://www.systemswiki.org/index.php?title=Systems_Thinking_World_Webinars The K-12 system dynamics listserv is a useful resource for practitioners who are applying systems thinking in the classroom - <http://sysdyn.clexchange.org/k-12sd-email-list>

Design inspired by Nature

William McDonough and Michael Braungart **Cradle to Cradle: Remaking the Way We Make Things** (North Point Press, 2002) - http://www.mcdonough.com/cradle_to_cradle.htm Janine

Benyus, **Biomimicry: Innovation Inspired by Nature** (Harper Collins, 1997) -

<http://www.biomimicry.net>

Edward O. Wilson – Biophilia – <http://www.worldchanging.com/archives/000664.html>
 David W. Orr. **The Nature of Design: Ecology, Culture, and Human Intention** (Oxford, 2002) AIGA's **Living Principles for Design** - <http://www.livingprinciples.org/>
Inhabitat – Green Design will Save the World - <http://inhabitat.com/about/> **The Designers Accord** – <http://www.designersaccord.org/>
Centre for Child Honouring - <http://childhonouring.org/>

Sense of Place

Wendell Berry – <http://www.wendellberrybooks.com/>
Experiential Education Canada – <http://www.experientialeducation.ca/>
Association for Environmental and Outdoor Education - <http://aeoe.org/>
Global, Environmental, and Outdoor Education Council -Free lesson plans, divided by grade. – <http://www.geoec.org/lessons/index.html>
Richard Louv – <http://richardlouv.com/>
Last Child in the Woods: Saving Our Children from Nature Deficit Disorder (2005, Algonquin Books) - <http://richardlouv.com/last-child-woods> **Leave No Child Inside Movement** - <http://www.kidsoutside.info/>

Eco-literacy in Higher Education

Second Nature: Education for Sustainability - <http://www.secondnature.org/>
Higher Education Network for Sustainability and the Environment (HENSE) – http://www.ulsf.org/pub_declaration_othvol33.html
North American Alliance for Green Education – <http://www.naage.org/>

Other resources in Environmental Education

Learning for a Sustainable Future – <http://www.lsf-1st.ca/en>
UN Decade of Education for Sustainable Development - <http://www.unesco.org/en/esd/>
Teaching and Learning for a Sustainable Future Report by UNESCO – <http://www.unesco.org/education/tlsf/>
Giraffe Heroes program – <http://www.giraffe.org>
David Suzuki – Environmental Education in the Classroom - <http://www.davidsuzuki.org/kids/teachers/classroom.html>
Earth Issues: Our Lifestyles and the Environment: An Environmental Education Manual for Children Grades K Through 5 (free PDF). Cowichan Valley Regional District, BC. – <http://cvrd.bc.ca/documents/Engineering%20Services/Solid%20Waste/Education%20and%20Outreach/Manual%20Feb%2021%20LR.PDF> **Eco-Kids** – <http://www.ecokids.ca/pub/index.cfm>
Ecological Footprint Calculators – <http://www.kidsfootprint.org;> http://www.zerofootprintkids.com/kids_teacher.aspx?cat_id=9 **Environment Canada – EC Educator Resources** - Provides access to featured lesson plans and links (divided for ages 6-12 and ages 13-18) - <http://www.on.ec.gc.ca/community/youth/ec-educators-e.html>
 Includes lesson plans and info about free educational programming that may take place in your area – <http://www.ec.gc.ca/education/default.asp?lang=En&n=D3D10112-1> **Environment Canada – Explore Water with Holly Heron** - -Activity booklet provided by Girl Guides Canada, experiments. Suitable for grades 1-3 – <http://www.ec.gc.ca/eauwater/default.asp?lang=En&n=88C2C5AD-1>

Environmental Protection Agency (EPA) <http://www.epa.gov/teachers/teachresources.htm>

Green Teacher Magazine – <http://www.greenteacher.com/>

The Groundwater Foundation – Kids Page and Sample Educator Resources – <http://www.groundwater.org/kc/kc.html>

One Simple Act – Alberta (Grades 1-6) – <http://onesimpleactalberta.com/get-involved/schooltoolkit.asp>

Re-Energy.ca – http://www.re-energy.ca/t_teacher.shtml

-Renewable energy project plans to build working models, teacher resources.

Resources for Rethinking – <http://r4r.ca/en/>

The Story of Stuff – Free 20 min video explains the cradle to grave cycle of our “stuff,” from production to disposal – <http://www.storyofstuff.com/>

Other Print Resources:

Worms Eat My Garbage by Mary Appelhof (Kalamazoo, MI: Flower Press, 1997).

Worms Eat Our Garbage: Classroom Activities for a Better Environment by Mary Appelhof, Mary Frances Fenton, and Barbara Loss Harris (Kalamazoo, MI: Flowerfield Enterprises, 1993).

The Worm Café: Mid-Scale Vermicomposting of Lunchroom Wastes by Binet Payne (Kalamazoo, MI: Flower Press, 2003).

Diary of a Worm by Doreen Cronin, illustrated by Harry Bliss (HarperCollins, 2003).

The Down-to-Earth Guide to Global Warming by Laurie David and Cambria Gordon (New York: Orchard Books, a division of Scholastic, 2007).

Greening School Grounds: Creating Habitats for Learning, eds. Tim Grant and Gail Littlejohn (Toronto: Green Teacher, 2001).

Teaching Green: The Elementary Years, eds. Tim Grant and Gail Littlejohn (New Society Publishers, 2005).

Teaching Green: The Middle Years, eds. Tim Grant and Gail Littlejohn (New Society Publishers, 2004).

Teaching Green: The High School Years, eds. Tim Grant and Gail Littlejohn (New Society Publishers, 2009).

Teaching About Climate Change: Cool Schools Tackle Global Warming, eds. Tim Grant and Gail Littlejohn (Toronto: Green Teacher, 2001).

Recycle This Book: 100 Top Children's Authors Tell You How to Go Green, ed. by Dan Gutman (New York: Yearling, 2009).

