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ENVT 499

Environmental Education: Connecting Eco-Literacy and Empathy to Promote Environmental Justice in Underserved Communities

As a settler of this land, it is important that I acknowledge the land that I am on to bring awareness to the historical trauma done by colonization. I am on the traditional land of the Puyallup people, who are known as "generous and welcoming to all people who enter their lands," the Nisqually people "the people of the river, people of the grass," the Steilacoom tribe who are still not federally recognized as a tribal nation, and the Squaxin Island tribe, who are known as "people of the water." These people inhabited their ancestral lands prior to the Medicine Creek Treaty of 1854, which subsequently removed them to make way for colonization. We recognize these people, as traditional stewards of this land who used and continue to use traditional ecological knowledge to maintain harmony between themselves and the Earth.

Abstract

In this paper, I seek to draw connections between eco-literacy and empathy and how they can be applied to environmental justice efforts. The anthropological focus of my paper analyzes the disparities in environmental access and understanding in regards to race and socio-economic status. Building from this information, I explain how integrating science teaching methods that focus on developing empathy will lead to social change through increased environmental comprehension among underserved communities. My work with *Wildlife Champions* highlights how an environmental education program can be successful in developing these traits. With climate changes on the rise and the disproportionate way in which it impacts marginalized populations, this work is more important now than ever because it addresses the systemic racial and income inequality issues in the United States while also providing the solution of implementing more environmental education programs throughout the country.

Introduction

The environment plays an important role in the daily lives of every person on the planet, but due to lack of adequate education, many people fail to understand how or why. The word "environment" can have different meanings depending on the context in which it is used, but in this context I mean outdoor areas dedicated to leisurely, recreational, and educational purposes. Positive interactions with the environment have been shown to benefit people's mental and

physical health, improve cognitive function, and increase levels of care towards nature.[1] While everyone is in constant interaction with the world around them, the extent to which people have positive interactions with nature is not equal across the board. Low-income and high-minority communities are unable to access outdoor recreation[2] while simultaneously disproportionately impacted by environmental degradation.[3] This paper seeks to understand how adequate access to outdoor spaces and environmental education improve eco-literacy rates while also influencing the development of empathy, a driver in enacting social change. I also investigate how, when eco-literacy and empathy are developed together in underserved communities, environmental justice practices can be put in place. This project explores this problem through the lenses of anthropology and science teaching. I analyze existing scholarly works and examine an ongoing environmental education program at Arlington Elementary School. The goal of this paper is to analyze how environmental justice, eco-literacy, and empathy interact and their importance to promoting social change in marginalized communities, and to advocate for the implementation of environmental education programs in K-12 schools. Social change is a necessary part of finding solutions to environmental degradation issues and involving more students in environmental education programs will provide them with the knowledge as well as the care needed to enact change.

Methods

Cultural anthropology is the study of human cultures and societies. Science teaching is a discipline that engages people with science through methods best suited for learning. These

[1] Chawla, "Benefits of Nature Contact", 433-52.
[2] Charnley, Susan, et al. "Environmental Justice, Low-Income and Minority Populations", NP.
[3] Taylor, Dorceta E., "Toxic Communities: Environmental Racism", NP.

disciplines are relevant to this research because I am looking at how a particular community (underserved peoples) interacts with society through the topic of environmental education. Anthropology analyzes human-environment relationships through participant observation. Participant observation is when "a researcher takes part in the daily activities, rituals, interactions, and events of a group of people as one of the means of learning the explicit and tacit aspects of their life routines and culture."[4] I incorporate this into my work by analyzing my observations from my past work at *Wildlife Champions*, an environmental education program at Arlington Elementary School.

It is important to note that originally, most of the concepts of anthropology and science teaching as disciplines that were to be used in my paper were to come from my own research through participant observation. Pre COVID-19, my plan was to observe ongoing lessons of *Wildlife Champions* at Arlington Elementary School. Here, I would use anthropological methods such as taking field notes while participating in the daily activities of my research participants (the Arlington students). This participant observation would also include information about science teaching. Science teaching methods have unique ways of conveying knowledge that include an emphasis on hands on learning, asking open ended questions,[5] and promoting fairness and equality.[6] Not only would I be observing the students ability to learn and use information, but I would also be observing teaching techniques and if certain methods were more successful and developing empathy through education. Unfortunately because of school closures related to the outbreak of COVID-19, I am unable to carry on with this research as originally planned. I was however able to adapt my research and methodology to use these disciplines in helpful

[4] Dewalt, Billie R., and Kathleen M. Dewalt. "Participant observation: a guide for fieldworkers", 1-253.
[5] Allen, Deborah, and Kimberly Tanner, "Approaches to cell biology teaching", 63-67.
[6] Theobald, Elli J., et al. "Active learning narrows achievement gaps", NP.

ways. I focused my attention on what anthropology and science teaching have in common: research analysis. With the extra time I spent at home, I was able to research anthropological and science teaching scholarly works more deeply. I also took the time to reflect back on my work with *Wildlife Champions* and made important connections between the program and how it relates to promoting environmental justice through psychological techniques like empathy.

Anthropology is one of the disciplines I use in my paper to analyze how different communities interact with the environment and why that matters. The eco-literacy section analyzes how anthropology looks at human and environment interactions along with who has access to education. The second section on empathy includes anthropological understandings of empathy and its relationship to enacting social change.[7] My section on environmental justice explains how people of color and those with a lower socio-economic status are systematically oppressed due to environmental degradation and how those interactions negatively impact people's lives.

Science teaching is the second discipline I use and influences not only what information is taught but also how that information is taught. Science teaching is a modern discipline that focuses on relaying science information through education, whether formal or informal. It emphasizes the use of effective teaching methods such as active learning and creating a "culture of inclusion."[8] A discipline is defined as a "particular area of study"[9] and not only is science education a specialization at many universities and colleges, it also offers unique teaching strategies and ways of knowing that are essential to understanding how the world works. The sections on environmental justice and eco-literacy in my paper use science teaching

[7]Segal, Elizabeth A., "Social Empathy: A Model Built on Empathy", 266–77.
[8] Theobald, Elli J., et al. "Active learning narrows achievement gaps", NP.
[9] "Academic discipline definition and meaning," NP.

methodologies to explain the importance of first hand experiences with nature and how information is distributed (if at all) to the general public about environmental issues. The section on empathy will analyze how hands on teaching and learning influences the development of empathy. Throughout each section, I will be analyzing how *Wildlife Champions* is effective in developing empathy in children, what that means for underserved students, and how it relates to environmental justice. Since science teaching relates to what and how information is taught, evaluating the effectiveness of science education programs is essential in determining if these programs should be a part of the solution to environmental degradation problems.

The disciplines of anthropology and science teaching will come together to form a comprehensive look into how underserved communities are being disproportionately impacted by environmental racism. Through the lens of anthropology I am able to analyze why people of color and low income households are unable to adequately access the environment, why understanding how empathy is developed in different people is important, and how empathy can then be used to promote social change in the face of environmental degradation. Through analyzing the methodology of science teaching and the ways in which science education is taught, I advocate for the implementation of more outdoor education programs like *Wildlife Champions* in an effort to improve eco-literacy rates and subsequently aid the development of empathy. Empathy drives social change, and when combined with eco-literacy, promotes environmental justice in underserved communities.

Background: Arlington Elementary

Arlington Elementary school in Tacoma, Washington is a Title 1 school, meaning a majority of its students are below the poverty line. A large amount of the student population are also people of color. The school is located not two blocks away from Oak Tree Park, but prior to the environmental education program called *Wildlife Champions*,[10] many of the students reported not even knowing that the park existed. Since the introduction of the program, however, teachers have reported the students are much more aware of the environmental issues faced by their communities and communities around the world. The program is part of an ongoing research project that is partnering with the Point Defiance Zoo and Aquarium along with Metro Parks, the Tacoma Nature Center, and Northwest Trek and investigates how empathy is developed through environmental education and how this psychological principle can be integrated into learning.[11] It is working to improve student's relationship with the environment through increased exposure to outdoor spaces and science knowledge, and researching if this increases a child's empathy towards nature. Unlike in many other Title 1 schools, this program was made possible thanks to a grant from an anonymous donor and has enough funds to run for three full years, including an environmental education summer camp. Because the program is supported by various organizations around Tacoma, a handful of environmental educators working for these organizations and who come from different backgrounds are able to be in the classroom teaching science lessons alongside Arlington teachers.

Arlington Elementary School was intentionally chosen as the site of the school because of its moral code along with its student demographic. Their mission statement emphasizes

[10] "Creating Wildlife Champions", NP.
[11] Smith, Andrea, "Inspiring empathetic wildlife champions", NP.

creating a safe community that "enriches and inspires the academic, social, physical, and emotional development of every child" through developing skills and strategies focused on stewardship and compassion towards the community and the environment. It also values diversity, acceptance, and inclusion.[12] Along with this, Arlington was chosen for this project because of its diverse student population. Because most of the students fall below the poverty line and a majority are people of color, their ability to access environmental education and outdoor spaces is significantly less than that of white and middle/upper middle class students.[13] This is significant because lack of access to natural spaces leads to a gap in eco-literacy between demographics, leaving the most marginalized without the ability to advocate against the environmental degradation that disproportionately impacts their communities. Along with understanding the links between eco-literacy, empathy, and environmental justice, this paper advocates for the implementation of environmental education programs in more schools, especially those that serve marginalized students.

Eco-Literacy

Eco-literacy is the concept of understanding the processes and inner workings of the environment. This not only includes the natural sciences like geology, biology, and chemistry, but also the social sciences like sociology and anthropology which help explain the interactions between people and the environment, and even literature and art which depict human's strong connection and historical view of the environment. Science teaching is a vital part of eco-literacy because it provides insight into the ways people learn about science and the most successful

[12] "Mission/vision/value statements - Tacoma schools", NP.
[13] Charnley, Susan, et al. "Environmental Justice, Low-Income and Minority Populations", NP.

methods for comprehending STEM issues. Eco-literacy will prove to be an important tool in the fight against environmental racism. Environmental racism is the theory that minority populations are disproportionately impacted by environmental issues due to systemic economic and social oppression.[14] Through anthropology, we are able to understand how different cultures and groups within one society comprehend and engage with nature. Participant observation gives anthropologists a look into the lives of different people, and studies have been done documenting the everyday interactions between humans and the environment. Observations like these help us to understand how varying levels of interaction with nature impact views of the environment. When science teaching and anthropology are joined together to understand eco-literacy, we are able to analyze the ways in which low-income and people of color have been denied adequate access to environment education, how this influences perception of the environment amongst different cultures, and why each of these play a role in promoting environmental injustice.

Learning about the environment is necessary in finding solutions to environmental issues, especially those that disproportionately impact marginalized communities. Education plays an important role in developing literacy rates among the general public because legally in the United States, all children must have some sort of kindergarten through 12th grade education. That being said, environmental literacy and education have been generally low priority for many schools.

In King County, for example, there are about 457[15]* public and private schools in 18 districts, 278 of which are Title 1 eligible.[16] Of all the schools in King County, about 300 in 14

[14] "Reading: environmental racism | sociology", NP.
[15] *This could be different because I could not find an official total count. I used the website K12 academics which led me to the websites of each school district in King County. From there I counted each public and private K-12 school in every district to find the total number of schools.
[16] "Closing educational achievement gaps", NP.

districts participate in the Green Schools Program.[17]This program encourages schools to practice conservation efforts and environmental stewardship through education. These types of programs are a wonderful way to develop people's understanding of the environment and why it needs to be protected, but because they are not offered at every school, a gap in public knowledge about these issues is created. The U.S. Department of Education has a program called "the Green Ribbon Program" that awards recognition to schools throughout the country working towards the three pillars of sustainability which are "first, reduce environmental impact and cost; second, improve the health and wellness of schools, students, and staff; and third provide effective environmental and sustainability education."[18] From 2016-2018 there were 18 honoree schools from Washington State.[19] Of those 18 schools, only 7 were Title 1,[20] so they receive more federal aid due to the high number of low-income students. Title 1 schools make up about 65% of the schools in Washington State,[21] but represent less than 50% of the schools recognized for their environmental education efforts. This reflects an issue surrounding the lack of accessibility for underserved students. A majority of the students learning about environmental issues and sustainability come from middle/upper class households, and because of wage inequality in America are likely white as well. Because our society is made up of many cultures and backgrounds that influence thinking, there is not a homogenous way of viewing the environment and the ways in which people interact with the outdoors can influence their understanding of environmental issues.

[17] "Green schools program", NP.
[18] "U.S. Department of Education," NP.
[19] "Previous green ribbon award winners", NP.
[20] "Search for schools and colleges," NP.
[21] "Closing educational achievement gaps", NP.

Understanding how underserved communities interact with the outdoors gives insight into ways in which these communities learn from the environment. Through my research into anthropological sources explaining human-environment relationships, I discovered how anthropology can help explain the human-environment dynamic in a general sense that can then be applied to individual communities. Considering how underserved communities experience some of the worst environmental degradation, understanding their perspective on the environment will help to develop empathy both inside and outside of these communities. Empathy, which I touch on more later, is a psychological function essential in determining how we as humans interact with the world around us. Eco-literacy is an important part of developing empathy because it increases one's exposure to the lives of people that are different from them. Increased exposure to environmental issues highlights how underserved communities are disproportionately impacted by these issues. Understanding this inequality generally leads to empathetic growth and a desire to make a change.

One way anthropology is useful in determining human and environmental relationships is by "allowing us to capture humans' practical engagement with the world."[22] This means that through anthropology we begin to understand the ways different groups of people view the role they play in the world. This is significant because different cultures have varying beliefs on what their role in the environment should be and in order to foster attitudes of environmental concern we must develop education alongside cultural values. Studies have found that morals based on environmental concern vary considerably between cultures even within the same country.[23] In the United States, for example Indigenous and Native peoples have strong ties with their traditional

[22] Frazão-Moreira, Amélia. "Challenging Approaches and Crossovers in Anthropology", 663-67.
[23] Burn, Shawn M., et al. "Gender, ethnic identity, and environmental", 136-45.

lands and because of that often view nature as inherently valued and in need of stewardship from humans,[24] which starkly contrasts the desire to master nature that is emphasized in parts of Western culture[25] like branches of Christianity and capitalism. When we understand how other people view the environment we can find ways for them to relate to it more. The uneven way people across the United States access the environment and environmental education in a positive way highlights the need for this understanding. It is impossible to fully empathize with a problem which we are not personally experiencing, but through education and science teaching, we are able to provide a basis of environmental awareness by uplifting the aspects of one's culture that hold positive views of nature. In doing this, perspective taking increases which can lead to the development of empathy and in turn social change.

Empathy

Empathy is a psychological development that plays an important role in our interactions with others and the outside world. In the context of environmental justice and empathy, I am advocating for not only people with privilege to have access to environmental education to better develop empathy for underserved communities facing environmental degradation; I am also promoting increased access to environmental education in minority communities in order for them to develop more empathy towards the environment and enact social change within their own communities. According to authors and human development researchers Nicole Mcdonald and Daniel S. Messinger empathy is "the ability to feel or imagine another person's emotional experience. The ability to empathize is an important part of social and emotional development,

[24] LaDuke, Winona. "All our relations: Native", 1-6.
[25] Burn, Shawn M., et al. "Gender, ethnic identity, and environmental", 136-45.

affecting an individual's behavior toward others and the quality of social relationships."[26] This means that all social relationships are impacted by the varying levels of empathy felt in human individuals. Another understanding of empathy is through "social empathy" which is "the ability to understand people by perceiving or experiencing their life and situations and as a result gain insight into structural inequalities and disparities."[27] Perceiving and understanding other people's life experiences highlights structural inequalities, therefore making empathy a vital part in enacting social change and progress. It is necessary to not only develop empathetic views towards those experiencing unjust environmental degradation but also give people the knowledge and tools to know how to make a change. Education is one way to develop empathy through the teaching of crucial information about environmental issues, but in order to effectively communicate the importance of environmental justice, educators must understand why empathy develops differently among people.

Empathetic actions and characteristics will look different for people in varying age groups, ethnicities, and socio-economic status because the development of empathy has to do with both genetic and environmental factors.[28] This means that people who grew up in the exact same environment and under the same circumstances may have different levels of empathy because of genetic factors. Anthropological research surrounding empathy shows that it is "partially determined by the evolved characteristics of the human species… but significantly constituted and structured by social, cultural, linguistic, and developmental variables as well."[29] For example, highland Maya and Inuit communities use empathy-like knowledge and

[26] McDonald, Nicole M., and Daniel S. Messinger. "The Development of Empathy: How, When, and Why", NP.
[27] Segal, Elizabeth A. "Social empathy: a model built", 266-77
[28] McDonald, Nicole M., and Daniel S. Messinger. "The Development of Empathy: How, When, and Why", NP.
[29] Hollan, Douglas, and C. Jason Throop. "Whatever happened to empathy?", 385-401

information in some instances to shame others for their wrong doings, while in Toraja, empathetic concern is built into the language and expressions of compassion.[30] This means that understanding how people from different backgrounds develop empathy is especially important if we want to continue to encourage its development. In order to educate people we must engage with their culture first, relating the environment to their own personal values and beliefs. Observing young students is a useful way to understand the relationship between upbringing and empathy, and offers people a better understanding of what exactly empathy looks like and how it can be used in environmental education. Studying children's response to the distress of others provides a good indication of empathetic development and can be used to better understand how empathy is developed. One study reports that the ability to perceive others emotions and experiences is an indicator of empathy development.[31] Perception of other people's experiences and feelings allows children to participate in effective helping strategies because they begin to understand the different ways people think, feel, and act. When developed alongside eco-literacy through environmental education programs such as *Wildlife Champions*, children begin to comprehend the severity of environmental issues, especially in underserved communities.

Although the development of empathy is a lifelong process in which people never stop growing or learning, it is possible to see a complete switch in children's interactions with nature from unempathetic to empathetic ones. During my time as an instructor for *Wildlife Champions'* summer camp program, I worked with children ages five to ten and taught lessons surrounding environmental education and care for nature. While in the park teaching my kindergarten students about the importance of all living creatures, one boy was incredibly scared of the

[30] Hollan, Douglas, and C. Jason Throop. "Whatever happened to empathy?", 385-401
[31]McDonald, Nicole M., and Daniel S. Messinger. "The Development of Empathy: How, When, and Why", NP.

thatching ants that call the park home. His fear turned into disdain as he spent about five minutes trying to step on and kill all the ants he could find. I tried to use different methods of relating the ant's life to his life, by saying things like "the park is the ants home" and "how would you feel if a giant came into your home and started trying to squish you?" to which he responded "I'd fight him! I'd kill him!" so it was clear that verbal communication was not going to help the situation. Although he listened to my instructions and halted squishing the ants, he was still unhappy to be sharing the same space with them until an ant got stuck on the top part of his shoe.

The boy looked down at the ant, who was desperately trying to defend itself from this giant by biting his shoe. Because the boy could not feel the bite through the fabric, he perceived it as the ant trying to hug him. Seeing this small, scary creature interact with the boy like one of his friends changed his disposition towards the insect drastically. After this situation, the boy grew a strong connection to the ants to the point where he was stopping other students from even unintentionally stepping on them. When we got back to the classroom the activity we had planned involved creating a habitat for a small animal using organic material the students collected during their time in the park. During this activity, the boy was even more engaged than in previous activities because he was creating a habitat for his friend, the ant. In the short span of a few hours, this student was able to perceive and understand the "feelings" and experiences of the ant which led him to change his views and actions towards the creature. This type of experience shows a connection between environmental learning/comprehension and empathetic characteristics that can have lasting impacts for both individuals and the world at large.

Empathy is important to underserved communities because it provides an increased understanding of the hardships people face on a daily basis. This increased understanding can

then lead to action being taken to enact much needed change. Empathy not only incorporates the involuntary mirroring of a person's emotions but also the ability to recognize the meaning of those mirrored emotions then take conscious steps to take empathetic action.[32] This is reflected in the interaction between the boy and the ant. At first he had negative feelings towards the creature, but after seeing some of his positive interactions mirrored in the ant in the form of what looked to be a hug, his demeanor changed and he took action to protect the ants. While saving the lives of a few ants may seem insignificant in the grand scheme of things, to that boy his actions were making a real difference. Because of the education and information provided to him through *Wildlife Champions,* that young boy now holds a greater respect for the environment. This type of education paired with the knowledge of how severe the environmental issues faced by underserved communities are will help enact social change.

Providing people with the ability to gain knowledge of other cultures and viewpoints fosters empathy which can then lead to positive social developments for marginalized groups. Education of non-dominant cultures also dissuades harmful stereotypes and ideological scapegoating, leading to people feeling more social responsibility and a desire to become involved.[33] Familiarization with environmental injustices through education and first hand experiences increases perspective taking, making it possible to analyze the underlying causes of these issues and what can be done to enact change. An example of change brought on by empathy that can also promote eco-literacy is through civic engagement. Civic engagement can take the part of community service or political involvement among other things and is beneficial in that it helps people learn how the political world is structured and influences a desire to work

[32] Segal, Elizabeth A. "Social empathy: a model built", 266-77
[33]Segal, Elizabeth A. "Social empathy: a model built", 266-77

towards a better community.[34] Civic engagement helps navigate the oppressive and complex environmental legislation that underserved communities often deal with, which increases eco-literacy rates, an important part of creating change.

Empathy develops through the interactions of people and others and is especially important in order to influence positive change in underserved communities. The ways in which empathy are developed have generally only been explored in a human to human context, but I argue that empathy can also be developed in a human to environment context. As with social empathy, empathy towards the environment can have lasting impacts that generate equitable change in marginalized communities. Environmental education programs can highlight how getting underserved youth involved with and learning about the outdoors can promote the development of empathy as well as eco-literacy, both of which when combined together can be used to fight against environmental injustices.

A unique program like *Wildlife Champions* offers students, who might have otherwise not had the privilege, a chance to explore and learn about their environment. The Point Defiance Zoo intentionally chose Arlington Elementary School as the site of this program because of its strong devotion to environmental stewardship, as well as its diverse student body. Naturalists from the zoo and other partnerships work alongside Arlington teachers to re-work the science curriculum, in accordance with Next Generation Science Standards, to focus more heavily on the interactions between humans and the environment and why stewardship and conservation are so important. Since elementary school teachers must focus on all disciplines throughout the school day, it is rare to find a primary teacher who focuses heavily on the sciences, especially environmental

[34]Segal, Elizabeth A. "Social empathy: a model built", 266-77

science. Having environmental educators working alongside teachers provides unique perspectives and diverse ideas on what lessons should be taught and the best ways to go about teaching them. This results in much of the activities being hands on, experiential learning rather than traditional lecture style. Once a week, the naturalists are in the classroom teaching lessons about the earth, then every month the entire school goes to Oak Tree Park for field work. The field work is important to science teaching because it helps solidify ideas taught in the classroom and makes it easier for students to visualize the material. *Wildlife Champions* uses intentional teaching from multiple disciplines because the program understands the complex interconnections between all subjects. They teach science lessons along with lessons in history, sociology, Native studies, and art in order to facilitate building connections between disciplines, and in turn all aspects of life.

Education that focuses on multiple disciplines, especially outdoor education is important when discussing issues faced by underserved communities because this type of learning has been shown to increase learning and retention rates while also benefiting both physical and mental health.[35] Better education influences perspectives on the role people play in the world and increases one's experience with different cultures. Because the student body is so diverse at Arlington elementary school, *Wildlife Champions* uses anthropological techniques related to cultural identity and environmental consciousness to engage with students. Educators take into account the unique perspectives every student brings by crafting lessons that include Western science along with Traditional Ecological Knowledge and other non-dominant cultural views of science. This program also works to connect students with the environment in a more emotional

[35] Kuo, Ming, et al. "Do lessons in nature", 1-15.

aspect. Anthropological studies have found that emotional aspects along with factual knowledge are what tie people to things like plants, animals, or nature as a whole.[36] This is accomplished through direct one on one contact with the outdoors and engaging in activities centered around the perspective of plants and animals. Education also provides the resources necessary to comprehend complex problems, including ones related to the environment. This, coupled with empathy drawn from new experiences empowers underserved communities to speak out against environmental injustices. A program like *Wildlife Champions*, which focuses on building eco-literacy and empathy at the same time, should be implemented on a larger scale where more of the population can access it, eventually leading to increased environmental justice efforts.

Environmental Justice

Environmental justice stems from the civil rights movement of the 1960's and was started primarily by people of color in the hopes of addressing the lack of environmental protections in their communities.[37] Even before modern science was addressing the issue of human made climate change, people of color were advocating for the environmental rights that white people got to enjoy, while they were being disproportionately impacted by things like hazardous waste facilities and industrial sites. Civil rights advocates spoke out against things like factories in heavily minority neighborhoods pumping out toxic pollutants known to cause cancer, and Indigenous activists protested for the right to access a clean environment to hunt and fish. Even though demonstrations were held and action by these communities was taken in the 1960's, the problems still remain to this day.

[36] Kopnina, Helen. "Future Directions in Environmental Anthropology", 91-108.
[37] "Environmental Justice", NP.

A major issue that has carried over throughout the decades is the placement of hazardous waste facilities and industrial zoning sites. These sites were disproportionately placed in low-income and high-minority neighborhoods[38] before the civil rights movement because segregated neighborhoods made it easy for the government and private companies to pick placements that would impact white communities the least while simultaneously oppressing marginalized communities even further. The continued placement of hazardous waste facilities and industrial zones in low-income and high-minority neighborhoods highlights another issue: the fact that there are still segregated neighborhoods, though segregation is now illegal in the United States. Neighborhoods continue to be segregated because of the dual housing model. The main idea behind the dual housing model is that "segregation ensues because whites preempt the best housing in urban centers as well as monopolize new construction in suburbia too."[39] Because of years of economic oppression, zoning inequalities, and gentrification that have awarded white, middle/upper class people an advantage over those of a lower socio-economic status and people of color, white people are able to buy the best houses in populated cities while also controlling construction in less populated areas. This prevents people of color and low-income individuals from accessing these areas, leading to segregation based on both race and socio-economic status. Once neighborhoods are segregated, large corporations and governmental agencies in control of landfills, hazardous waste facilities, and industrial zoning start placing these sites in the marginalized communities that do not have the resources to fight back against these injustices. Human's mental health and well being is linked to the outdoor environment they are exposed to as both children and adults,[40] so experiencing environmental

[38]Taylor, Dorceta E., "Toxic Communities: Environmental Racism", NP.
[39]Taylor, Dorceta E., "Toxic Communities: Environmental Racism", NP.
[40] Chawla, "Benefits of Nature Contact", 433-52.

degradation on a daily basis could negatively impact one's health and could even shape adverse views towards the environment in general.[41] This is significant because perception of one's environment influences their reaction to environmental degradation and desire to enact change. One solution to this problem that seems simple is to direct these people to national parks and forests where they can enjoy nature without the threat of health problems or ugly aesthetics, but the reality is that the ability of underserved communities to access national parks and forests is just as unlikely as their ability to access healthy outdoor spaces at home.

The Pacific Northwest is a prime example of an area that is still impacted by environmental racism, despite its seemingly progressive views and policies. Lush with natural green spaces across Washington, Oregon, and Idaho, one might think that a majority of the residents of the PNW enjoy outdoor recreation and activities in their free time. The reality is that a high majority of patrons to Northwest Forest Plan forests are middle/upper class white families and individuals. In studies conducted by the Northwest Forest Plan, the results showed that less than half of the people that visit these forests had household incomes of less than $75,000 a year. Due to the unequal distribution of wealth in the United States, most of the people visiting the forests were white, with only 4% of the visitors being people of color.[42] Barriers like lack of time or money, safety concerns, lack of transportation, and lack of multilingual signs were stated as reasons why people cannot or will not visit national parks and forests. These issues disproportionately affect marginalized people, like those in a lower socio-economic status or people of color, because they do not have the resources or the power to demand change when it comes to environmental justice.

[41] Chawla, "Benefits of Nature Contact", 433-52.
[42]Charnley, Susan, et al. "Environmental Justice, Low-Income and Minority Populations", NP.

In order to solve environmental degradation issues, we must look to the root of the problem instead of just addressing the symptoms like the placement of hazardous sites or unequal access to natural spaces. Evaluating these issues highlights the connection between culture and societal oppression. According to R. Gregory Roberts in *Environmental Justice and Community Empowerment: Learning from the Civil Rights Movement,* the underlying cause of environmental racism is the powerlessness underserved communities often feel. Racism in America is a long, ongoing issue that is built into the social hierarchies in place in our society.[43] Because racism is a systemic issue in the United States, unequal access to things like money and education have been propagated by the government and its policies which leads to underserved communities without resources, funding, or even awareness of the discriminatory environmental practices in place. Lack of adequate resources increases a community's powerlessness by limiting their ability to learn about and speak out against these injustices. In order to combat this systemic racism and the ongoing oppression of underserved communities, more intentional eco-literacy, with focuses on the psychological development of empathy, must be integrated into public education. As described above, experiencing and understanding another's perspective is a main driving force behind social change. Involving more students with environmental education programs like *Wildlife Champions* not only ensures a future with more diverse scientists, but it also provides the opportunity for children to experience more than just the dominant culture, leading to a future with fewer environmental injustices.

Science education is a pillar not only of education but of society as a whole. Whether obvious or not, environmental education plays a part in everyone's daily lives and is especially

[43] Roberts, R. Gregory. "Environmental Justice and Community Empowerment", 229-267.

important to anthropology in the modern world. The impact of climate change is being felt by more people each year, with those in underserved communities like coastal tribal nations or the impoverished in areas affected by drought, being hit the hardest. Because low income and minority folk have unique relationships with nature, more inclusive and accessible environmental education will ensure a better understanding of how different communities view the environment and the sustainability practices they seek to put in place. Once the anthropology of environmental education is better understood, that information can then be used alongside science teaching to provide a unique and significant environmental education program.

Environmental education programs like *Wildlife Champions* utilize science teaching methods that are instrumental in providing a foundation for other types of learning. Science teaching, unlike other disciplines of education, allows students both young and old to examine evidence in a systematic way, interpret and control one's surroundings, and empowers people to be participants in learning and not just observers.[44] These characteristics can then be applied to other academic disciplines as well as in the world outside of academia. *Wildlife Champions* and other environmental education programs promote this through hands-on data collection and exploration of environmental spaces. Environmental lessons in elementary schools often revolve around the basics of earth and life systems in a way that builds off of itself and provides a foundation for future knowledge. For example, my experience as an educator with *Wildlife Champions* included teaching students about climate in one lesson then animal adaptations in another. Once we were out in the field, I was able to connect the two lessons and explain how climate is a factor that leads to different ecosystems and how various animal species adapt to

[44]Michaels, Sarah, et al. "A new vision of science", 1-16.

different ecosystems. Teaching science like this, starting with two (or more) ideas as separate first then bringing them together once the basics are understood creates a deeper comprehension of the material.

Science teaching ensures that environmental education is implemented in a way that is conducive to student learning and can be applied to life outside of the classroom. Environmental education programs that implement the "5E Model" establish a basis of learning based on engagement which leads to more information being learned and retained. The "5E Model" is a planning tool based on research that explores the ways in which humans learn and proposes teaching in a particular order using particular methods.[45] The methods start off with engagement, where the educator encourages interest and invites students to think about their own experiences. It then moves to exploration where students interact with basic subject matter and rely on prior knowledge to explore possibilities and questions. This leads to explanation, where in the context of environmental education programs, educators and students are both actively participating in new material through lectures or class discussions. After explanation comes elaboration, where instructors give students the opportunity to take what they learned and apply it to new material. Finally, the evaluation stage provides an opportunity for students to explain their new knowledge through things like projects or tests. *Wildlife Champions*, along with other environmental education programs, rely heavily on methods like the "5E Model" when constructing lessons and activities to ensure quality education that can be utilized in disciplines other than science. Since science teaching techniques like the "5E Model" have been shown to improve learning quality

[45]Tanner, Kimberly D. "Order matters: using the 5E model", 159-64.

and understanding, programs that use those practices are vital in schools, especially schools in underserved communities.

Conclusion

Environmental education facilitates a STEM culture filled with diverse experiences and perspectives that lead to empathy building and increased eco-literacy rates in underserved communities. Underserved communities face the biggest environmental burdens, whether in terms of hazardous waste facility placement or denied access to natural spaces, but have historically been unable to speak out due to lack of knowledge, resources, and understanding from the dominant culture. Environmental education programs increase one's experiences with and awareness of issues that marginalized people face on a daily basis. This increased awareness leads to the development of empathy which leads the fight against environmental injustice through enacting social change. This has been highlighted through the work done by *Wildlife Champions*. This type of educational program is able to develop empathy through active learning in a hands on setting. It not only works to promote eco-literacy among underserved students, but it's attention to the diverse backgrounds of the students creates a culture of inclusion and care that can then be observed through their interactions with the environment. By engaging a larger population of students in conservation and sustainability efforts through environmental education, we will promote a society of understanding individuals devoted to the implementation of environmental justice practices.

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