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Cultivating Hope:

The Influence of Positive Outlooks in K-12 Climate Change Education

Agnes Brown

Abstract
Students studying the environment know and feel the emotional toll that it can take. This can easily contribute to mental health issues and utter defeat. This paper addresses the exclusion of optimism from environmental education and the impacts this has on childhood development and students as they advance to higher levels of education. Through this analysis, the goal is to find a role for hope in a topic typically framed in an apocalyptic manner. The shift from denying the existence of climate change to denying that it can be addressed, particularly through the usage of "doomsday language," has created a culture of pessimism, hopelessness, and despair in environmental education, and led to further mental health issues among adolescents. Climate optimism is often looked down upon as naive; however, few studies have actually analyzed the potential utility of hope in environmental education. This paper aims to bridge that gap in data with a case study on Fordham students majoring in environmental studies and how their childhood environmental education affected them. chapter 1 defines climate pessimism and presents quantitative and qualitative data on the issue using past studies. This chapter talks a little about environmental psychology, and how harmful doomsday language can be. chapter 2 provides the history of childhood environmental education and the role climate views have played in the past. Further, it discusses past studies that have been done on the role of hope in environmental education. chapter 3 evaluates the effect of pessimistic and optimistic approaches in childhood education and the impact they have on childhood development, and expands on chapter 1, proposing a framework for climate change that psychologists recommend. chapter 4 introduces the current governmental and school policies on environmental education, and chapter 5 expands on this, diving into critical dialogue about future recommendations for redesigning the curriculum and proposing changes and alternatives to better address the crushing defeat that many students feel in environmental education.
Keywords: environmental policy, environmental education, environmental history, developmental psychology, climate optimism, climate pessimism, environmental psychology, educational psychology

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Introduction: Environmental Studies - Solidarity in Burnout

I am an environmental studies major. My peers and I are beaten down, burned out, tired, and stressed. It is becoming increasingly difficult to stay positive facing this climate crisis with the way environmental education is framed. Environmental education is typically taught and talked about in quite an apocalyptic manner, and in my experience, the few times hope is offered in class, it is followed by extreme urgency and a strong sense of doubt. This feeling is reflected beyond the bounds of the classroom; when I tell people I'm an environmental studies major, I am either met with pity— "I don't know how you study that" — or admiration— for working in "such a depressing field". This raises the question: why would anyone choose to put their money towards a topic so deeply entrenched in calamity? After sitting in the discomfort of that reality for some years now, I've realized that it's little glimmers of hope— those that persist in spite of this doomsday narrative we're fed — that keep my passion for environmental education alive. The possibility for change, and the potential we all possess to enact that change, is an empowering, essential, and seemingly abandoned aspect of environmental curricula. For that reason, I have set out to evaluate the role of hope within environmental education and discuss climate optimism vs climate pessimism. By the end of this thesis, I will propose a redesign to the curriculum in schools and a policy change within the government.

There's no denying the fact that we are in a climate crisis— with unpredictable weather patterns, unprecedented heat waves, and devastating droughts sweeping the globe, it is not just environmental studies majors who are feeling the gravity of this situation. Due to the sheer pervasiveness of this issue, there has been an attitude shift in the media and in environmental discourse from climate denial to climate dooming, from denying that climate change exists to apocalyptic language claiming the earth is doomed for good, as I described within my personal

schooling experience. Climate optimism is often looked down upon as naive, but few studies have actually investigated the role that positivity plays in environmental education. This paper will explore whether this doomsday framing of education is effective in creating an atmosphere for change, and how the role of hope could be beneficial in this context.

I have no intention of being all-encompassing in this debate, for I feel that would take more pages and more qualifications than I have, but I would like to point out this growing issue and begin to attempt to address it, specifically within the realm of childhood development. chapter 1 will define the term 'climate pessimism', present quantitative and qualitative data on the issue, and briefly discuss how it impacts mental health and childhood development. In chapter 2 I will provide a brief history of environmental education and the role it has played in the past. chapter 3 will expand on what is introduced in chapter 1, evaluating the effect of pessimistic and optimistic approaches in childhood education and the impact they have on childhood development. Further, I will discuss past studies that have been done on the role of hope in environmental education. chapter 4 will discuss the current governmental and school policies on environmental education. Finally, In chapter 5 I will dive into critical dialogue about future recommendations for redesigning the curriculum and propose changes and alternatives to better address the crushing defeat that many students feel in environmental education.

Chapter 1. Climate Pessimism

Climate Pessimism vs. Optimism. This chapter will define and examine the quantitative and qualitative data on climate pessimism in relation to environmental education, and briefly outline their associations to the ecosystem services. Environmental education is the study of the natural world and how it is influenced by our interactions with it. I'll expand on this definition in

chapter 2. Anders Nordgren, a scholar, research associate, and professor in bioethics, defines pessimism and optimism as follows: “a psychological process or state of expecting a negative or positive, respectively, outcome of processes or actions, an argued position of expecting a negative or positive, respectively, outcome of processes or actions” (Nordgren 2021, 2). Dominic Mcafee, ecologist, and psychologist, talks a bit more about the psychology of optimism and pessimism saying:

> The positive psychology of optimism and hope help us attain positive feelings (Bailey et al. 2007) that contrast their opposites—pessimism (psychological trait) and fear (emotional state). Optimism and pessimism inform our expectation that events will turn out positively or negatively, but although optimism is infused with achievement, helplessness is at the core of pessimism (Peterson et al. 1993, Seligman 2006). Within this duality, hope is similar to fear, in that they are both future-oriented emotions that respond to uncertainty on the basis of reward or punishment (Chadwick 2015).

We can expand Norgren’s and Mcafee’s definitions and explanations of pessimism to understand climate pessimism, resulting in this definition: expecting climate change to lead to doom. David Higgins, a psychologist, offers an extremely similar definition in his study titled *Climate Pessimism and Human Nature*, “the belief that catastrophic global heating cannot be prevented” (Higgins 2022, 1). Climate optimism would then be defined as the belief that this crisis can be prevented or mitigated.

Climate change is arguably the biggest threat facing humanity today, with harmful weather, the spread of diseases— as we recently witnessed with the COVID-19 pandemic—and many other unmeasurable consequences on the horizon. This is the consensus among the population according to Pew Research Center, with three out of four people across 19 different

countries answering that they felt climate change was the greatest threat to their country in Spring 2022 (Pew Research Center 2022). There is no doubt that this is a very real issue facing humanity, but when teachers or people express deep doubt that climate change can be mitigated or adapted to, fail to teach students about solutions or fail to empower students in the face of this crisis, that's identified as climate pessimism, as mentioned above in pessimism's definition.

The general assumption appears to be that fear is the right way to inspire people to act on this issue. Since the 1970s, fear appeals and negativity have fueled environmental news. For example, In the last 50 years, the gap between positive and negative words used in scientific journal article titles having to do with environment, ecology, habitat, or biodiversity has doubled, with negative words taking a striking lead (Dominic Mcafee 2019, 2). Many school systems have perpetuated this thought. This may (arguably) have worked in the past, but with the seriousness of environmental degradation today, we need to change the way we frame the issue. Many educators are now realizing that this 'raising awareness' of climate change has turned into teaching our students that the future is grim and that there may not be time to save it (Blumstein & Saylan 2007, 99). This projection of fear "may actually cause children to turn away from nature in order to cope with the fear" (Blumstein & Saylan 2007, 99). In a study on US news coverage of climate change, impacts of environmental degradation were frequently discussed without associated actions to address these impacts (Hart and Feldman 2014). Furthermore, the study found that although news coverage often carries information about the threats of climate change and how it may impact the US, there was rarely an efficacy message (Hart and Feldman 2014). Positive efficacy was only reported about one-third of the time, and always alongside negative efficacy information (Hart and Feldman 2014). Positive efficacy and negative efficacy sum up to mean climate positivity or climate negativity, respectively. A nationwide study on

schools in the US showed that more than 22 states earned lower than a B on the ‘hope’ aspect of climate change education, and 23 states earned less than a B on the civic participation aspect (NCSE 2020, 8-11). Blumstein cited this same issue in his book about the failure of environmental education. He explains that hope is missing from the environmental education curriculum in America (Blumstein 2007, 28). This trend is true not just in school systems– of the Americans surveyed by IPSOS, 37% believed that climate change could not be mitigated or slowed (IPSOS 2023, 2). I have found this to be true in my experience as well; the majority of the material I've consumed is meant to play into people's climate anxiety or fears, particularly through the use of apocalyptic rhetoric. In the Fall 2023 semester, I was logging my observation hours for the Fordham Graduate School of Education as a student teacher, and I kept careful notes about when and how environmental education was taught. I was fulfilling this requirement in a 5th-grade general education classroom, where all subjects were taught. Out of the 50 hours I logged, climate change was mentioned just two times. Both of these times that it was mentioned, it was related to extreme natural disasters and drought. The examples used in class told stories of families losing everything, and communities completely destroyed. Students were asked whether they would leave if this were to happen to them. When I talked to students during a discussion, many expressed fears that this would happen to their place of residence and that they wouldn’t know what to do. This material is also content that is meant to inspire change, instead, it is shutting people down and closing them off to the idea of hope.

Considering this looming climate crisis – not to mention the framing of it –, there’s no doubt that people are having very negative feelings, like worry or grief. The presence of these feelings in the midst of such pressing conditions is extremely normal; however, this has precipitated somewhat of a hopeless culture, and deeper mental health issues among adolescents.

There is an important distinction between having feelings of fear about the future and playing into climate pessimism. As we have all felt, climate change is not an emotionless process. To the younger generations and people directly affected, especially, it feels personal; it is personal. To grieve, or worry, is one thing; losing hope for humanity's future altogether is a markedly different phenomenon. Just like the distinction between fear and climate pessimism, there is also a strong importance in the distinction between blind optimism and climate optimism, or hope. This is why it is important to leave room for that grief when dealing with climate change. Schlegel explains in her article about emotions and climate change, "to avoid tapping into a trap of blind optimism, we should thus resist the urge to resort too quickly to positive feelings, and engage with the diverse range of emotions, including painful ones entangled with environmental loss, and seek hope grounded in practices rather than particular emotions" (Schlegel 2022). Blind optimism can be risky and can cause people to act irrationally, but hope can play a role of inspiration, and can allow people to continue the fight in a landscape of despair. (Mcafee et al., 2019, 3). Coexisting emotions are an integral part of the human experience, and therefore should undoubtedly be considered when laying the groundwork for education and action. Some scientists and psychologists suggest that balancing these positive and negative viewpoints and emotions can create a more promising foundation for promoting engagement and action in environmental education (Mcafee et al., 2019, 2). Again, dealing with climate change and this eco-disaster is not an emotionless process by any means, and recognizing this fact is the first step in educating ourselves and the next generation. This is a topic that I will expand on later in this chapter, as well as in chapters 3 and 5.

This paper is centered around the terms 'climate pessimism' and 'climate optimism' concerning childhood education, and where that feeling of hope can fit within the classroom

setting. I will dive deeper into where optimism and pessimism fit within the context of childhood development and education in chapter 3.

Environmental Education, and Ecosystem Services. Where does environmental education actually fit in terms of the environment and nature itself? There are four different types of services that the ecosystem provides to us: provisioning, regulating, cultural, and supporting. This paper deals mostly with cultural services, but environmental education and climate views (pessimism vs optimism) can be applied to the entire ecosystem. Provisioning services are products that we obtain from the ecosystem, like food, water, or medicine. Regulating services are the benefits that we get from the regulation of ecosystem processes, like erosion and flood control, carbon sequestration, and pollination. In our environment, there are a multitude of cycles that keep our soil rich, our water from disappearing, and oxygen in the air. These are called supporting services. Finally, cultural services are the non-material benefits we get from ecosystems. This could range anywhere from the health benefits we gain from being submersed in nature to sensory experiences. Being in nature has proven to have benefits for mental and physical health. The climate has to do with primarily two of the services: regulating services, and cultural services. Unfortunately, these ecosystem services are being degraded, and this has led to some pessimistic views about whether or not there's hope for our natural world. Since 1990, GHG, greenhouse gasses, have exponentially increased, causing global temperatures to rise, and environmental crises to emerge worldwide. In this paper, I will be focusing on cultural ecosystem services, and the mental health effects of climate change which can lead to and be caused by climate pessimism.

The concept of ecosystem services is related to how environmental education can help deal with climate pessimism. Education on provisioning services is important in understanding

the world, and it provides an essential basis for building with more advanced environmental disciplines. It provides knowledge on where we get the things we need to survive, and a comprehensive understanding of provisioning services could result in a call for change in the agricultural and water systems to better sustain the population. Climate optimists see this room for change and act to transition from, for example, fossil fuels to renewable energy sources. Climate Pessimists often perpetuate the rhetoric that we have already exhausted these resources, that there is no turning back, and that it is too late or unrealistic to make the switch to renewable resources. An awareness and knowledge about these provisioning services can allow students to decipher their own view on whether it is possible for the environment to continue to sustain us in this way, and they are able to better understand how their own personal contributions can positively impact the world around them.

Similarly to why we need education on provisioning services, students need to learn about regulating services and supporting services to understand just how important the environment is to us. Regulating services have the potential to halt the spread of diseases, and because climate change is hindering this service, we have now experienced a global pandemic. It is not pessimistic nor optimistic to say that from now on our weather patterns, disease spread, and atmosphere will never be the same, but we as humans have a great capacity to adapt, and that is now what climate optimists are focusing on in this department. Supporting services explain a lot about agriculture, and how to practice agriculture sustainably. Educating students about this provides potential for inspiration about new farming practices that better feed the population and take care of our soil. This is just one example of how teaching these services is important.

Last, but certainly not least, the ecosystem service that I discuss most in this paper are Cultural Services. Being in Nature is part of survival. Children *need* it (Louv 2005, 12). It is

shown that spending time in nature has benefits to your mental and physical health, and is especially important for childhood development. I believe cultural services are closest to us, in terms of how we experience ecosystem services, but are the least talked about within the context of climate change. In this paper, I will discuss the benefits that the environment provides to child health alongside the benefits of including optimism in childhood environmental education. These ecosystem services are extremely connected. Climate doomers often argue that it is too late to keep these ecosystems afloat, and since things have been slow to move previously in politics, that speed will continue while our ecosystem degrades further and further.

Greenhouse gases (GHGs) are gases in the earth's atmosphere that trap heat in the atmosphere at night. The most common ones emitted by humans are Carbon Dioxide, Methane, and Nitrous Oxide. At their natural levels, they sustain life on Earth, without them, we would freeze at night. However, human activities like burning fossil fuels emit excess greenhouse gases, creating an intense warming effect on our planet, with catastrophic effects on life everywhere, changing weather patterns, and melting ice caps causing the sea level to rise. Since 1930, GHG emissions have quadrupled, threatening and beginning to destroy the ecosystem services I described above ("Global Greenhouse Gas Overview | US EPA" 2024). Environmental education is an essential tool in combating this crisis, empowering the next and current generations to adequately address this issue should be of top priority for educators and frankly, all people around the world.

The Dangers of Pessimism. Arguably, the effect of poor environmental education, or presenting environmental problems in such an apocalyptic way to students, is the degradation of all other environmental services, because it will lead to further neglect of our environment. Students cannot act adequately without proper and empowering education. Doomsday language

in terms of the environment that encourages anxiety and furthers inaction is not infrequent. You can find plenty of articles and OpEds describing ‘annihilation’ and ‘apocalypse’ due to climate change just by a quick Google search. There is quite literally a clock in Union Square called the “Doomsday Clock” that students pass every single day, and is portrayed on social media for all of those who don’t live in New York City to absorb. There is also a surplus of films, novels, TV shows, and other media portraying a dystopian future resulting from the effects of human activities and climate change. Watching movies like *Wall-E* and *Interstellar* as a child paralyzed me with fear in a way I can’t describe. While I am sure the goal of this media is to inspire people to work to save our environment, It did not have this effect on me, or anyone I know, for that matter. Instead, I was only fear-stricken and experiencing nightmares every night. This phenomenon is the flight or fight response that humans have when we feel fear (Dominic Mcaffe 2019, 2). This response can lead to avoidance and denial. Persistent messages of climate pessimism have worse effects– fatiguing society into inaction, and social norms may exacerbate this, making people avoid topics that are considered ‘depressing’ (Dominic Mcaffe 2019, 2). It is no wonder that young people are reporting climate anxiety and worry at progressively higher rates, and feel as if they might not even have a future (Clayton et al 2021). With little to no power politically and impending crises on the horizon, the well-being of this generation is bound to feel the effects of this doomsday discourse that has been cultivated (Wullenkord & Ojala 2023).

Another danger of apocalyptic framing in relation to climate change is the removal of the responsibility of humans to deal with the issue. Apocalyptic framing can make the problem seem rather otherworldly as if humans have lost the ability to control climate change (Foust, Murphy 2009). Additionally, apocalyptic framing often perpetuates the polarizing nature of climate

change in terms of ideation. It makes it seem like a hypothetical issue, because right now we are clearly not dealing with an Apocalypse, but other tragedies like natural disasters. This is why it is important in education to base learning on facts, and describe climate change using actual human activity, which I will describe further in the following chapters.

The idea that the climate affects mental health is not a new one, it dates back all the way to Ancient Greece. Now, with a completely changing and different climate, not to mention the negative framing, these effects are bound to be much more severe. Climate change and climate anxiety have been linked with the degradation of mental health among adolescents and in some cases with people directly affected by climate change, suicidal ideation, and substance abuse (Clayton et al. 2021). Because it can be even harder to act when coping and dealing with mental health issues, we need to uplift young people to believe and know that there is a way we can adapt and mitigate. Climate anxiety and mental health issues are not just related to the eco-disaster, but also the portrayal of the crisis in education and the media, the continuous feelings of betrayal from the government, the failure of people in positions of power to address the situation, and flat out just feeling generally unheard (Hickman et al 2021). Doomsday language makes students feel like the effort towards addressing climate change is far from worthy of pursuing.

Redesigning the Curriculum for Climate Optimism. Promising news on environmental conservation and action is not challenging to find; there are many sources on the internet who focus on reporting only positive climate news to combat the flood of negativity we generally see about climate change in the media. There has been about a 70%- 80% deduction on commercial fishing in the past 7 years, an increase in the amount of protected land, and many organizations and people fighting for environmental remediation every day (Mcafee et al., 2019, 2). Optimism

has value in other fields, from sports management to business leadership, and has great potential to help inspire action in environmental education as well (Mcafee et al., 2019, 2). To address Climate pessimism in education, I will be proposing a redesign of the curriculum in schools to better include a role of hope in fighting climate change. This redesign should include uplifting messages, like those above, making children's voices heard, and action-based learning. I propose that schools and teachers should modify, add, and change their curriculum to include integration of climate change in all subjects, a social-emotional approach to climate change, and community-driven action. An integrated emotional approach to learning is required for an adequate environmental education; as I mentioned, climate change is an emotional process. In order to avoid blind optimism and/or climate anxiety or other mental health issues, teachers should be more readily equipped to guide students through open conversations about their feelings surrounding climate change. Students must learn about the facts while also being taught about opportunities for action (James, Davidson 2021). Community-driven action has also been proven by numerous studies to be a powerful tool in encouraging students to enact change. Community-based learning has made students feel more valued and gives them more of an initiative to act (Stachl 2021). This change needs to come from the government, as they are the only entity that has the means to provide regulation to all K-12 public schools in the US. This change, however, will only be inspired by action from all groups, fighting for a better education for generations to come. Teachers and educators cannot take on this new curriculum alone– as I explain in the following chapters, they are already underappreciated and ill-equipped to handle and teach such emotions that are tied to climate change and environmental education. Redesigning the curricula in schools to include these few things and reframe apocalyptic messaging in environmental education has a great potential to reduce mental health issues caused

by climate anxiety among adolescents, empower the next generations to enact change, and maybe even see that change unfold. I will go into detail about this in chapter 5.

Chapter 2. The History of Environmental Education

This chapter will explore the history of environmental education in the United States, specifically in K-12 public schooling. As I explained in chapter 1, climate change is a real and pressing problem that must be addressed, and environmental education plays a role in working towards a more sustainable future. There are many important reasons to consider and understand the long history of environmental education; it is integral to learn about the past curriculums to investigate what works to empower young children against environmental harm and what doesn't. In addition, there is a false consensus among some populations that environmental education is a relatively new idea. In actuality, it has been around for hundreds of years. There have been several types of environmental education from the 18th century until now, but modern-day environmental education is widely defined as an effort to teach about the natural environment and how humans can influence and manage ecosystems to create a sustainable future.

Unfortunately, a lot of the history of environmental education in the US has not been recognized or recorded, largely because it was pioneered by Native Americans, and throughout history their practices have been erased in western culture. While I did learn some information about environmental education from indigenous people, I will be focusing on western thinkers and systems, because it is more accessible information in terms of the media available to me. This isn't to say we should not be learning from indigenous education models– I believe quite the opposite, actually. UNESCO reports this in their findings as well, stating that Indigenous

knowledge should be better incorporated into environmental education worldwide (UNESCO 2021, 10). Incorporating Native American history and environmental education models into curriculums could potentially solve a few of the gaps in environmental education that I discuss later in this chapter.

18th Century to 1960s. Early philosophers and scientists like Jean-Jacques Rousseau and Louis Agassiz in the 18th and 19th centuries began to stress the importance of studying nature and the benefits of being outside. Rousseau published *Emile,* in which he discusses that education should include studying the environment. Agassiz published articles to support his theory about the benefits of students learning directly from nature. These thinkers, and others like them, helped create a foundation for education on the environment, commonly called 'nature study' (McCrea 2006, 2). This was the beginning of environmental education in Western culture. These philosophers were drawing on the long tradition of 'natural history' going back to the ancient Greeks and Romans, and its inclusion in education. Natural history is a mainly observational study of living organisms and their environments. Natural history was taught at the postsecondary level, like Plato's Academy, and in the medieval university curriculum. In the 19th century, this evolved in Western universities into natural sciences, such as biology, chemistry, physics, and ecology. Then in the 20th century, which I will discuss in the coming sections, it evolved into environmental sciences and studies.

These early thoughts from the 19th-century philosophers were built on Wilbur Jackman's *Nature Study for the Common Schools* in 1891. Jackman stresses the importance of children learning through 'function' in nature. He explains "Natural science, concerned largely with the earth and the living things it supports, affords the earliest and the only direct means of introducing the child to his earthly habitation" (Jackman 1891, 6). This philosophy then led to

the establishment of the American Nature Study in 1908. The first president was Liberty Hyde Bailey, who renounced the term ‘environmental education’ because of its confusing nature (McCrea 2006, 3). This term was later defined and adapted by William B Stapp, which I will discuss in further detail.

Some other environmentalists cite another early thinker – Scottish Professor Sir Patrick Geddes – as one of the first to link the environmental world and education in Western culture (Palmer 1998, 4). In the late 1880s and 1890s, he brought students into direct contact with nature, much like the ideas that Rousseau and Agassiz argued for. His work encouraged the formation of the School Nature Study Union in the UK, which eventually transformed into the National Rural and Environmental Studies Association (Palmer 1998, 5). Movements like these around American and European countries have been said to be the roots of terms like ‘environmental studies’.

The importance of education on our environment was again stressed during the early 1920s and 30s, when the Dust Bowl swept through West America, causing widespread agricultural devastation. This is now called the Conservation Era. During this environmental crisis, ecology emerged as a scientific discipline and scientists began to study more comprehensively about the natural world. There was a transition from ‘nature study’ to ‘conservation education’. They differed in the sense that conservation education was much more focused on science, like ecology, and environmental management to solve the agricultural devastation that many were experiencing during this era. Conservation education took place outside a traditional classroom setting, with conservation agencies providing this education for people in agricultural settings. These agencies also aimed to inform the public about pro-conservation strategies and ideals, causing a public push for environmental education to be

incorporated into curriculum in K-12 schools and not just taught in this informal setting (Stapp 1974, 46).

Late 20th Century. Environmental education in the United States really took off in the late 1960s and 1970s, after Rachel Carson's publication of *Silent Spring* and the birth of the environmentalism movement. The United States had been in the process of dealing with nuclear fallout, the Cold War, the Vietnam War, and the Civil Rights movement causing unrest in America and concerns about health and waste. These issues and the concern about pesticides raised in *Silent Spring* sparked fear among the public and paved the way for the first Earth Day in 1970 and a new environmental education movement.

Environmental history emerged alongside the environmentalism movement out of growing health and environmental concerns. Environmental history aims to study the impact humans have had on the environment, and how the environment has affected humans. The most inclusive definition of environmental history that I have found in my research is "environmental history is studying the interaction between humans and the environment in the past. To study the relationships between humans and the surrounding world, we must try to understand how the interaction between the two works" (Oostheck, 2). Environmental history is an interdisciplinary topic, meaning it brings together many professions like historians and scientists. Scientists may have to apply history to their work or vice versa. The discipline has grown and changed substantially over the past 50 years, starting as just an idea to flourishing into an academic subject (Oostheck, 4).

Environmental education was first defined by William B. Stapp in "The Concept of Environmental Education" in 1969. He defines it as follows:

> Environmental Education is aimed at producing a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, aware of how to help solve these problems, and motivated to work towards their solution (Stapp 1969, 34).

Our definition has clearly not evolved a whole lot since this, but the field has, and it has so much room for improvement in our changing world while still staying true to this original definition. Stapp outlines four major objectives of environmental education: understanding that humans have a great influence on the environment, understanding of the biophysical environment, understanding of the environmental problems and our responsibility in solving them, and attitudes of concern for the quality of the environment "which will motivate citizens to participate in biophysical environmental problem-solving" (Stapp 1969, 35). This last objective is especially important to contemporary issues of climate pessimism. Stapp argued for delivering factual information and informing students on how to use these attitudes to set goals and take action. Climate pessimism is not always factual and does not empower or help students set goals. This fundamental idea by Stapp is something that I will be circling back to in the following chapters.

In 1970, US Congress passed the National Environmental Education Act of 1970 which created the Office of Environmental Education, domestic grants for environmental education, and a National Advisory Council for Environmental Education. In an address to Congress President Nixon stated:

> It is also vital that our entire society develop a new understanding and a new awareness of man's relation to his environment—what might be called 'environmental literacy.'

> This will require the development and teaching of environmental concepts at every point in the education process (Carter & Simmons 2010, 7).

This address was the first clear national call for a system of environmental education in the US. The Office of Environmental Education was funded through grants and awards and pushed the development of environmental education curricula, allocating a small amount of funding for environmental education programs to be developed in schools. Educators were hoping this bill would bring its promise of integrating environmental education into K-12 schooling, however, there was not an effective incorporation of environmental problems into the curriculum, and the funding only supported the next five years of environmental education (Palen 1991, 17). The implementation was mostly science-based, and schools did not teach about environmental issues or influence action (Blumstein 2007, 28). Still, it was an important turning point, it was the first time that environmental education was implemented into federal law. The office was unfortunately eliminated by 1981, but then promptly re-established under the EPA in 1990. The constant battle for environmental education to be written into law is illustrated by the instability of government funding/policy on environmental education. In the following years after 1970, many strides were made. There were many publications of research and national/international conferences to promote environmental education and develop curriculum, however, the same problems that conservation biologist and ethologist Daniel T. Blumstein analyzes remained.

During this era (1970s and 1980s), many public schools were not committed to incorporating environmental education into their curricula. A nationwide look by environmental educators at environmental agencies in 1982 revealed that environmental education often fell as an ‘extra duty’ for science teachers, and was rarely taught at an interdisciplinary level like the federal acts had intended (Palen 1991, 18). Blumstein reported this same issue in his findings–

environmental education was often offered outside the regular school day, forcing teachers to spend time they were not compensated for (Blumstein 2007, 29). In a study done on the US East Coast, it was found that only 10 percent of schools surveyed provided environmental education for more than 2 hours a week (Palen 1991, 25). Further, environmental education only really addressed the awareness stage, rather than the solution-based stage (Palen 1991, 26).

From 1990 to 2000, many strides were again made within environmental education, but again, none were really successful in implementing environmental education into the K-12 public school systems. I'll mention a few important ones. In 1990, the US Congress passed the National Environmental Education Act of 1990. Similar to the Act of 1970, it provided more grants and the reestablishment of the Office of Environmental Education, as previously mentioned, however, it also provided environmental education training programs. In the years that followed, people continued to fight for environmental justice and education, and task forces continued to publish their findings on environmental education, such as the report published in 1999, *From Classroom to Community and Beyond: Educating for a Sustainable Future.*

It was also in this era that climate change began to emerge as a hot public topic. 1988 broke records for being the hottest year worldwide, and it has just kept getting warmer since (Lindon 2022, 10). Public interest in climate change also spiked during this era, but it was thought to be a gradual change as opposed to a real threat in the near future (Lindon 2022, 11).

21st Century. Although climate change did attract public interest before this, I have found that many more people took it seriously as a rapid issue in the 2000s. It was now understood that climate change was visible and happening before people's eyes (Lindon 2022, 11). However, schools and governments have been slow to incorporate this knowledge at the curriculum level, and there are still fundamental issues including the lack of influence for change in the classroom.

Education on these facts without education on action can quickly create a pessimistic environment, as students don't know if there is anything to do facing this crisis.

Although we have seen a huge increase in learning about the environment since the 18th century, most K-12 schools do not incorporate an integrated interdisciplinary environmental education program into their general education curriculum. Because environmentalism has become so polarized politically, Blumstien cites that it has not developed into what it needs to be saying that most schools cannot teach students to influence change (Blumstein 2007, 28). Saylan, the other author of *The Failure of Environmental Education (And How We Can Fix it)* and environmental educator, continuously emphasizes the lack of relevance in current environmental curricula. Students are being taught issues that they cannot apply to their own lives, leading to a gap in engagement in this area.

In 2020, a study was conducted grading schools across the country on their science program using these standards: climate change is real, humans caused it, it is affecting us, and there is hope. Only 27 out of the 50 states and Washington DC earned a B+ or higher on this grading system, and only 5 earned an A- or higher. This study found a number of common problems with the curriculums in the US— promoting debate as to whether climate change exists, failing to name climate change as a specific issue, "muddling the science", and failing to provide hope (NCSE 2020, 5-6). This last point is especially important in the fight against climate pessimism in education. This is not just a problem in the US; a study done by UNESCO across 46 states and all regions of the world found that while most (92%) curriculums mention the environment at least once, less than 50% of those curriculums actually went into depth about environmental problems and climate change (UNESCO 2021, 9). Further, these curricula fail to

teach the socioemotional and solution-based components of climate change and environmental curricula, which is critical to combating climate pessimism.

But it hasn't only been bad news for environmental education– as we entered the 21st century, there was an emergence of a new wave to promote K-12 environmental education from environmentalists concerned about children's health and development and organizations across the country. Many parents and people became concerned that children weren't spending enough time outside, and that this could be causing developmental issues or learning disabilities like attention deficit hyperactivity disorder. This push from worried citizens did cause some policy changes, which I will discuss in chapter 4. Many organizations and programs, like the Environmental Literacy Council, National Wildlife Federation, and National Environmental Education Foundation, have created resources and opportunities for teachers and students to learn about the biology, chemistry, and ecology of our natural world. These organizations and programs like them support and promote hands-on experience in the field, with some taking students on field trips to learn about and see certain animal populations or create service opportunities for students to preserve and create habitats in urban spaces ("Wallerstein Collaborative for Urban Environmental Education and Sustainability", n.d.).

This concludes what I will discuss in terms of the white/European history of environmental education. We have come a long way, but there is still more work to be done. Clearly, there is a lack of incorporation of environmental education in schools, and curricula are missing an important component of solution-based learning and climate optimism. I'll expand on the current environmental education policies in chapter 4.

Indigenous Environmental Education. In a conversation about any type of education, we must work to include many cultural perspectives and histories in order to not perpetuate the

long-standing issue of white and Eurocentric history being taught as the unequivocal truth. Students come from many different backgrounds and need to be taught in a culturally responsive manner to connect with their identities and connect with the world around them, in this case, the environment.

Before Europeans forcefully settled in what we now know as the United States, Native American nations thrived all over the country, rich in diverse cultures, languages, and ideas. Europeans saw this country as unoccupied land for the taking, tricking, and slaughtering of tribes of people for expansion, thereby establishing a white supremacy mindset and state. During this time, Education was unfortunately weaponized. Native American children were kidnapped and taken from their homes and forced into boarding schools in which they were assimilated into white American society (Lesiak 1992). With this history in mind, educators and all people can challenge and examine education curriculums to combat the long history of assimilation and white-centric history in environmental education.

Because there are so many different cultures within the umbrella term Native Americans, it is hard to condense a rich history of environmental knowledge and education. Indigenous knowledge is strongly connected to the location of ecosystems in which it was born (Ziehr 2022, 18). The survival of Native Americans was dependent on a complex understanding of natural processes within their environment, and this understanding is deeply rooted in their identities, meaning there is little separation between humans and nature (Beckford et al., 2010; Barnhardt & Kawagley 2005) This connection is a quintessential example of environmental education, a comprehension of the natural world. Native American children learn these processes through practical hands-on experiences and integration of all subjects, exactly the changes I wish to see in K-12 schooling (Cajete 2000, 80).

Although much of indigenous history is oral, and not recorded by white America, we can take the knowledge we do have about Native Americans' relationship with the environment to put it to use in classrooms all over the US. Children need to feel connected to the environment to want to save it, a connection that Indigenous people have been mastering for thousands of years. Educators should incorporate and integrate these perspectives and others like them into their curricula, which I will discuss further in chapter 5.

Chapter 3. The Psychology of Pessimism and Optimism

This chapter analyzes both pessimistic and optimistic approaches and their influence on childhood development. It also delves into the significance of these approaches in the context of environmental education and the challenges posed by climate change. Due to the stresses of climate change and learning about climate change, many students have been experiencing climate anxiety. This can lead to mental health problems and suicidal behavior, as described in chapter 1. We need to find a way to teach our students about climate change in a manner that allows them to process emotions and deal with anxiety healthily.

Introduction to pessimistic and optimistic teaching approaches. Firstly, it is worth introducing where students generally lie in terms of optimism and pessimism. It is found that students and people usually lean towards optimistic dispositions. A study done on children aged 9-13 confirmed these past findings and showed that students were much more likely to be optimistic about their own future than the future of the world (Fischer et al 1986, 245). Optimistic views have been shown to have physical and mental health benefits, enable students to set goals, help to cope with anxiety and pain, help to recover from calamity, and make commitments towards a better future. Studies have also found that there is a correlation between

current happiness and optimism. On the other hand, pessimistic views have been linked with depression, and hopelessness has been linked with suicidal behavior (Fischer et al 1986, 242). Students who showed a pessimistic disposition are also usually more likely to display problem avoidance, withdraw from lessons, and a failure to meet their goals (Gilman et al 2009). Further, programs with teaching styles that promote optimistic views were linked with lower levels of depression in youth (Gilman et al 2009). With these associations, we can begin to see the importance of optimism within childhood development and education.

Child Psychologist Teresa Borowski released a framework of developmental assets for children under the Search Institute– these assets include optimism and empowerment and can help educators understand the need for positive environmental education. Positive Identity, a belief in one's self-worth and idea of control over their future, and Empowerment, feeling valued through safety and respect, are two important developmental assets for children (Borowski 2019, 1-2). Created in 1990, these assets provide internal and external strengths and support for children to foster a positive lifestyle and avoid making 'risky choices' (Borowski 2019, 3). With this developmental framework in mind, we can see the importance of optimism in environmental education. In the following sections, I will explore how these findings on optimism and pessimism fit into our changing climate and environmental education.

Climate anxiety and mental health issues. Mental health issues have become especially prevalent in young people. According to the 2022 National Healthcare Quality and Disparities Report, mental health is the leading cause of death and disability in people aged 3-17, and suicidal behaviors among students have increased by over 40% since 2009 (2022 National Healthcare Quality and Disparities Report 2022, 73). Almost everyone in my life has been afflicted or known someone to be afflicted with mental health problems, and I myself have lost a

friend to suicide. I say this to emphasize what a gravely serious issue this is, and its importance to me. Part of the intense rise in mental health issues that we have seen is due to the challenges youth face with climate change. There are numerous terms that psychologists and scientists have used to describe this response to climate change, the most common being climate anxiety and eco-anxiety. There is no doubt that mental health is a real issue with increasing prevalence, and promoting healthy mental states is of the utmost importance, especially within the scope of environmental education.

Climate change is causing mental health problems in adolescents. Reports like the National Climate Assessment have begun to cite mental health effects as a side effect of climate change, and Organizations like the American Academy of Pediatrics warn that climate change poses a threat to the physical and mental well-being of children (Plautz et al., 2020). People who have been affected directly by climate change are more likely to develop mental health issues. After Hurricane Katrina, about 49% of people living in the affected areas developed mental health problems, such as anxiety and depression (Clayton et al 2017). Another example of this is the displacement of people as homes become less habitable due to rising sea levels or the land's inability to support food crops. Migrations/Immigration for this reason can become stress factors and make people feel alienated or a sense of loss for their community.

But it is not just people who are experiencing these extreme weather events that can develop mental health problems; all people are affected by climate change and have the potential to be affected by climate anxiety, especially young people. As I mentioned in chapter 1, climate change is an inherently emotional subject. It is threatening to humanity and affects people's lives and futures. Issues emerge, however, when extreme emotions affect our ability to process information, hinder decision-making, and render us disabled. These feelings/inabilities are

associated with climate anxiety. Climate anxiety doesn't necessarily constitute a mental illness itself, but has been shown again and again to lead to mental health issues if not dealt with properly (Clayton et al 2021, 37; Hickman et al 2021, 9; Mental health and climate change: policy brief 2022, 6; Marks et al 2021, 8). The prevalence of this climate anxiety in the United States is shocking– one survey by the American Psychological Association reported that over two-thirds of Americans felt this 'eco-anxiety' and one-fourth of Americans felt it in an extreme way. (Clayton et al 2021, 37). Another study on high school-aged students reported that 60% of students felt 'very' worried about climate change and 45% felt that it was affecting their lives on a day-to-day basis (Marks et al 2021, 5). Further, on a global scale, a survey reported that *every* student they had reached out to from over 50 countries reported feelings of eco-anxiety or existential dread due to climate change (Hickman et al 2021). Children have exhibited this climate anxiety and mental health effects from climate change to higher degrees, and because childhood is a critical time for brain development, these issues can have long-term effects on children's lives in the future (Clayton et al 2017, 35). This could be due to worry that they will live in a future that will be substantially affected by climate change, an image perpetuated by the media's pessimistic portrayal (Clayton et al 2021, 37).

Further, Climate anxiety has led to new psychological phenomenons, with one medical journal reporting that a teenage student was hospitalized after refusing to drink water during a drought, authors called this 'climate change delusion' (Plautz et al., 2020). Another display of the extreme– a psychiatrist reported that one of their patients secretly hoped for a global pandemic to ease the stress on the planet (Plautz et al., 2020). Climate change and the negativity surrounding it in educational settings is causing students and youth stress that they cannot properly deal with, leading to mental health issues.

Influence of Pessimism. This uptake in climate anxiety and mental health issues related to climate change is often influenced or accompanied by pessimistic views. As I introduced in chapter 1, there is a general assumption that fear appeals will best get the attention of the public on the severity of climate change. Susanne C. Moser, research scientist, and author, describes this phenomenon in her book, *creating a Climate for Climate Change*:

> Scientists and editors of Flagship deplore the inattention given to climate change, and on and off the record suggest that 'a useful catastrophe or two' and other fear-provoking measures (such as terror alert systems for the state of climate change) are needed to motivate adequate policy response. Similarly, policy advisors and politicians evoke currently resonant public fears, such as weapons of mass destruction, terrorism, and war and compare to the seriousness of climate change to that of more frightening issues. (Moser 2007, 69-70)

This use of fear appeals by scientists and politicians is pessimistic in the sense that they are creating an illustration of climate change as an issue that will not be fixed. These pessimistic views are causing the mental health issues and climate anxiety that I highlighted in the last section.

Students in Boulder, Colorado, attending a climate resilience brainstorming session, agreed that pessimism in the news has led to more climate anxiety, citing that they mostly get their information on climate change via social media, leaving little room for empowerment and action (Clayton et al 2017, 41). Many other studies have also confirmed that fear appeals have not led to active engagement in a given issue (Moser 2007, 70). Research has shown time and time again that these fear appeals do not lead to engagement unless they point the audience in the direction of a solution (Mcafee et al., 2019, 1). The examples of climate pessimism I illustrated

in chapter 1 do not give pathways to a solution, perpetuating the idea that this crisis cannot be fixed. Message framing that focuses on the positive effects of acting rather than the negative effects of not acting is shown to be much more influential for young people (Corner 2017, 527). These pessimistic approaches and teaching styles only lead to strong emotions and climate anxiety and do not elicit the action that it is meant to.

Most of the time coverage and education of climate change tends to isolate the problem without teaching solutions. This approach is pessimistic by simply not even including a road for change, leaving students feeling like there may not be one. One study on young people's voices on climate change highlights the danger of 'individualizing the problem' of climate change, explaining that no roads to action do not contribute to a complete understanding of climate change and can increase climate anxiety among youth (Marks et al 2021, 9).

Repeated exposure to these fear-grabbing negative messages can create learned helplessness among people (Mcafee et al., 2019, 3). While it is true that the shock effect from fear can be attention-grabbing enough for short-term purposes, it is by no means the way to ignite long-term change, and the burden of these fear-inducing messages can be too much to carry over long periods of time (Mcafee et al., 2019 3; Rendueles 2023).

Influence of Optimism. Studies and researchers have found that the most important factors in fighting climate anxiety and mental health issues due to climate change have been motivation to act, or the belief that climate change can be adapted to/mitigated, and an understanding of the inherent emotional process when confronting climate change. These factors are extremely linked and influenced by optimistic views. It has been consistently found that hope and action have a positive correlation with students (Ojala, 2012; Goodes et al, 2022). Most studies and surveys have cited helplessness as a reason for mental health issues concerning

climate change, so we can avoid projecting these feelings of helplessness onto our students by showing them that there are ways to act and set goals for a more sustainable future, inspiring hope, and action.

Doctor of Medicine, Elizabeth Haase, explains that progress towards healthy mindsets in children can be reached through the ability to grieve and articulate emotions with a combination of hope and 'coping advice' (Clayton et al 2017, 36). One of the first tips that psychologists give when facing climate change is to 'foster optimism'. Optimism can contribute to one's ability to cope with the negative emotions that climate change brings and builds resilience to feeling depressed and anxious in a scope of climate despair (Clayton et al 2017, 42). In a study done on mothers who survived Hurricane Katrina, it was found that optimism was a driving factor in their adjustment and coping after the disaster (Lowe et al 2014).

Another way to influence hope in children's education is to encourage and teach children to set goals. An optimistic disposition alone is not necessarily associated with pro-environmental action, but optimism and the group or individual belief that they can influence an outcome is where action and engagement start (Mcafee et al., 2019, 3). Goals can show children that they can influence an outcome or change an outcome if they work to achieve it. Setting and achieving attainable and well-specified goals has been shown by research to be a foundational component to imparting hope in children and adolescents (Gilman et al 2009, 44). Depending on the student's age and abilities, these goals could range anywhere from collecting trash in the neighborhood, a commitment to only washing clothes once a week, or organizing a protest or petition in the neighborhood. All of these goals seek to create an action plan for mitigating one's personal or other's carbon footprint or drawing awareness to climate change as an issue but are still attainable for young people. This type of action-based learning can create a foundation for

hope while students are still learning about climate change in a larger context to combat the onset of climate anxiety. For students who don't feel the effects of climate change directly as much as others, these goals could also focus on helping those more that are more directly affected. In psychology, research has consistently shown that one's well-being can be positively affected by helping others (Clayton et al 2017, 51). These findings have also corroborated within the context of climate change; many studies and surveys highlight the importance of 'giving back' for people's own coping and healing processes after climate disasters (Clayton et al 2017, 52). Setting goals in practice constitutes solution-based learning when implemented in the classroom.

Another psychological finding that has been proven to enhance positive dispositions is spending time in nature. As I mentioned in chapter 1, there is growing concern that children are developing learning disabilities and disorders because of their lack of time spent in nature. Sarah Milligan-Toffler and Cathy Jordan of the Children & Nature Network combine the importance of goals/action and spending time in nature:

> We know that hands-on engagement in the outdoors allows children to experience these benefits and develop a deep love of the natural world. Engaging children even in small actions can help them feel like they are part of the solution. Planting pollinator friendly plants, picking up litter, or creating compost from food waste and using it in a garden are all climate-friendly ways for children to engage with the natural world. Even the very young can take positive actions for themselves, their communities, and the environment. (Clayton et al 2021, 39).

Children's wellbeing and mental health can benefit from an education that includes nature and being outdoors. Some environmental education programs aim to address this deficit in nature interaction among youth, citing that connecting with nature can promote optimism and various

other benefits, including improved mental and physical health, improved conservation ethics, and even academic outcomes as a whole (Vatovec 2022, 1). In learning about climate change, it is important to provide students with ways they can cope with this stress, so it doesn't become a more serious mental health issue.

Children should also be spending more time in nature to connect with the environment around them. Students feel more inclined to act on climate change when they can engage with it directly. Similar to goal setting and experiencing nature firsthand, this type of education includes a more action-based or solution-based curriculum. Studies have found that when students are feeling more distanced from climate change, they don't act in the same conservative way as a student who connects with the issue emotionally and directly. Some schools tackle this issue by encouraging students to solve real-life scenarios and put them in the shoes of environmental stakeholders. This should be done with caution, as teachers should make it possible for students to be able to at least address part of the issue with their skill sets, so as to not further discourage students with pessimistic outlooks.

While learning about climate change, students need to be learning about their emotions and how to process them. A study performed on students and how they cope with climate change found that meaning-based coping, acknowledging the problem while finding meaning in values and beliefs and positively reframing the problem, is the most effective way of promoting hope without denying climate change is an issue and positively associated with pro-environmental behavior (Goodes et al 2022). Emotional processing is a learned skill and therefore must be integrated into climate change lessons, we cannot just dump information about climate change on students without thinking about the implications. More and more teachers and schools are promoting emotional well-being and emotional learning, so this could easily be combined/ taught

alongside environmental education. Public K-12 schools do have psychologists and school counselors on board to help students who are struggling at no cost, but similar to the issue teachers are facing, these psychologists are not equipped to deal with climate change issues such as climate anxiety. School psychologists are trained to assess and test students who may qualify for additional services, like an individualized education plan, they support individual students through various mental health and developmental issues and collaborate with parents and teachers. They also can connect families with other services and make sure that parents are meeting their students' mental health needs. School counselors have similar duties, but they focus more on the entire student body, crisis intervention, and preparing students for their future, like their next academic or professional step in life. Both of these careers can also include providing individual or group counseling on coping skills and social skills and conducting assessments of social-emotional and behavioral needs. These counseling groups have the value of helping students learn about their emotions and how to process them, specifically related to climate change. However, many school psychologists and counselors feel they are already taking on more than they can handle, and climate change is another pressing issue that is causing anxiety that these workers are ill-equipped to handle (Mann 2019). Part of the understaffing and underfunding of school counselors and psychologists is due to the increased funding for security measures in schools. We need to push for more funding for hiring counselors and psychologists rather than security measures.

It is clear that there needs to be optimism and empowering messages incorporated into environmental education. Fortunately, there are many ways to make this happen. In this chapter, I described six psychological strategies to improve environmental education: fostering optimism, setting goals, creating an action plan, spending time in nature or outside, and connecting with the

environment. These strategies can be used to help engage students in environmental education that doesn't lead to extensive climate anxiety, as it has been doing. In the following chapters, I will discuss how we can incorporate these ideas into K-12 education. As I introduced in chapter 1, we can redesign school curricula to uplift and inspire students to act and work toward climate mitigation. In chapter 5, I will be taking this information about the psychology of optimism and pessimism and working it into my recommendations for a better environmental education in K-12 schools.

Chapter 4. Current Environmental Education Policy

Environmental Policy is defined as any measure that governments, corporations, or organizations take in relation to the effects of human activities on the environment, specifically measures taken to reduce environmental harm and protect ecosystems. Environmental Policy is an extremely crucial aspect in protecting the ecosystem services I described in chapter 1. Similarly to why students need to learn about these ecosystem services, they also need to learn about policy and how it works so they can find their place in the complex politics and how to spark action. In this chapter, I will give a brief description of environmental policy in America and explain the policy in the US regarding environmental education at the city/school, state, and federal levels.

Environmental Policy and Education at the Federal Level. Environmental policy in America is often overlooked. The problem of climate change has been continuously ignored as 'bigger' issues face the nation. When new environmental protection policies have been introduced in the past, it is usually due to an environmental crisis, like the introduction of many environmental acts after Rachel Carson drew attention to the negative effects of DDT and other

pesticides in *Silent Spring.* But we can't afford to wait for big disasters or for more major health issues to arise due to climate change and environmental education for political change. This failure of the political system to keep up with environmental degradation has contributed to students' distrust of the government and their pessimism about future governmental actions (Blumstien & Saylan 2007, 174).

Just because the government has failed or lacked on the environmental protection front in the past, however, does not mean that it doesn't have the potential to fulfill the needs of environmental policy in the future. In fact, many of our civic responsibilities today are currently legislated, such as testifying in court, serving on a jury, and attending school (Blumsten & Saylan 2007, 177). I bring this up to illustrate that it is entirely possible to pass legislation that requires people to act in an environmentally conscious manner.

The Environmental Education Act of 1990 which I briefly mention in chapter 2 was actually the most recent major legislation for environmental education on the national level. This was over 30 years ago when the populations' beliefs and understanding of climate change were quite different. While the act did require the EPA to provide 'national leadership to increase environmental literacy', there are no provisions on requiring environmental education at the school level. This is shocking considering the dire state of the environment and the increasing need to understand how we can take steps to address climate change. There is no K-12 national environmental education curriculum in the US, it is left to state governments, schools, and other entities to decide the standards for curricula.

To understand the US's environmental policy on environmental education, a little more background information on the National Environmental Education Act of 1990 (NEEA) is necessary. While this act did accomplish some good for the field of environmental education, it

also has many issues and is extremely outdated. The NEEA established an 'environmental education and training program' in which there was classroom training on the environmental sciences, careers in the environmental field, and current environmental issues ("National Environmental Education Act | US EPA" 2023). The act also recommended support of a library with information– digital or hard copy– on environmental issues and education ("National Environmental Education Act | US EPA" 2023). These ideas are very necessary for the development of adequate education, but the NEEA was written and enacted before the modern digital age, and when a small amount of money did have the ability to make an impact in the environmental education realm (Potter 2010, 25). The NEEA was not written to enact a systematic change that we so desperately need, because people did not recognize the severity of the issue at that time. Rather, it was written with the intention to introduce the issue of environmental harm (Potter 2010, 25). Nowadays, most people are well aware of the issues, with IPCC reports accessible online and media coverage of climate change. We need to transition from awareness to understanding and action. From the appropriation of the act in 1992 to 2009, a bit under 100 million dollars has been allocated towards supporting environmental education curricula in and outside of schools (Potter 2010, 24). While this may seem like a lot of funding, it is only about 6 million per year spent trying to create an environmentally literate citizenry, and there is very little other outside funding that environmental education gets. This is just simply not enough for every teacher in K-12 schools to develop and implement an adequate environmental education program. This lack of funding and support from the government may be why some teachers are forced to turn towards apocalyptic framing and fear factors to attempt to instigate action in students – they don't have enough resources to develop a proper curriculum.

There cannot be a conversation about environmental policy and environmental education without mentioning the No Child Left Behind Act of 2001 (NCLB). This controversial act gained bipartisan support and quickly rose to dictate and change education in the US. It is now known as the Every Student Succeeds Act (ESSA); Barack Obama reauthorized the act in 2015. Although it is not technically in effect today, NCLB changed the field of education drastically and has had a lasting legacy on K-12 schools in America, and the ESSA remains similar in some ways. In fact, much of what happens today in education policy and practice is viewed through the lens of NCLB and ESSA (Gruenewald & Manteaw 2007). NCLB aimed to hold schools and teachers accountable for students' proficiency levels, particularly in reading, writing, and math. Although the Act did require some testing in science, about once every three years, the emphasis on high-stakes testing for reading, writing, and math resulted in teachers centering their curriculum around these tests, leaving science, and especially ecology and environmental education, behind (Brewer et al 2003, 384; Gruenewald & Smith 2014, 79). In addition to the marginalization of science in regards to testing, the ‘proficient’ level of science for K-12 schools included no education on climate change (Gruenewald & Manteaw 2007). Though this Act is outdated and has been reauthorized, it remains true today that there is no federal legislation mandating or even outlining possible curricula on climate change.

In 2005, Richard Louv published the book *Last Child in the Woods: Saving Our Children From Nature-Deficit Disorder.* The book drew attention to new and old research emphasizing the importance of direct exposure to nature for healthy childhood development. Louv argued that children today suffer from a lack of contact with nature, titling this epidemic ‘nature-deficit disorder’. The publication created a grassroots movement and widespread interest in children’s environmental education. As a result, several bills titled No Child Left Inside (NCLI) were

introduced into the Senate and House of Representatives. The *No Child Left Inside Act of 2008* and the *No Child Left Inside Act of 2009* were introduced by Senator Jack Read and Representative John P Sarbanes, respectively, and mainly aimed to amend the previous No Child Left Behind Act. The proposed bills would provide federal education funding to states to promote better inclusion of environmental literacy plans. They also aimed to provide teachers with training to better equip them for the introduction of environmental education into the curriculum and to develop studies to see how worthy these types of programs (environmental education and nature study) are in childhood development. These bills were not voted on in the Senate (Bodor et al 2019, 5). Although they never were enacted into law, they did draw attention to the importance of environmental education.

Within this legislation that I have discussed clearly, there are some major gaps to fill. There are still some major barriers preventing students from learning about climate change in an emotionally responsive, optimistic, and empowering manner, and in some states, learning about climate change at all. Most teachers feel ill-equipped and under-supported by the government, making it hard to teach students about climate change and manage increasing climate anxiety (Maledone 2023). There are no specifics on teaching environmental degradation in K-12 schools let alone how to teach ecology to students or the socioemotional learning component of learning about climate change. As I have outlined in the previous chapters, climate change is causing students immense amounts of stress, anxiety, fear, and other negative emotions that they can't cope with without proper education. Climate change needs to be taught as an inherently emotional process to prevent students from feeling like they cannot process these overwhelming emotions. I will talk more about adding this to environmental policy in chapter 5.

Environmental Policy and Education at the State level. Of all 50 states and Washington DC, just over half have adopted science standards for K-12 schools that include understanding of 'human-caused climate change' (Shelley & Niepold 2020, 3). Only 18 states have standards that mention the concept of environmental sustainability, and very few connect environmental sustainability to other subjects, such as economics, trade, and politics (Shelley & Niepold 2020, 4). Most of these states have adopted the voluntary national standards, Next Generation Science Standards (NGSS) (Shelley & Niepold 2020, 3; Madelone 2023). NGSS includes human impact and human sustainability as units in middle school and high school ("Topic Arrangements of the NGSS" n.d.) The requirement and push to teach climate change and environmental sustainability in K-12 schools does seem to be on the rise. In 2020, New Jersey passed a law mandating the inclusion of climate change in K-12 school curricula and this was implemented in 2022 (Madelone 2023). In December of 2022, Connecticut followed New Jersey's footsteps.

A longtime state leader in environmental education and climate education is Colorado. In chapter 2, I mentioned a study conducted determining the effectiveness of state environmental education standards; this study assigns a grade (A, B, C, D, or F), to each state based on a few different criteria. Colorado is one of 5 states that earns an A on their climate change education standards, with one reviewer noting that Colorado has "detailed, explicit, and well-organized standards that are exploring climate science domains here with detail and nuance" ("Making the Grade?" 2020, 14). In 2010, Colorado signed a bill into law titled the Colorado Kids Outdoors Grant Program, which recognized the importance of outdoor education on the health of people, specifically youth (Hartman 2023). This bill required that the state board of education adopt a statewide plan for environmental education, and partners, the Colorado Department of Natural Resources, Colorado Department of Education, and the Colorado Environmental Education Plan

develop a plan for environmental literacy (Hartman 2023). Under this bill, Colorado educators drew on existing partnerships with families, communities, teachers, and organizations to develop a curriculum that promoted environmental education (Hartman 2023). The environmental education plan aimed to support students in bringing environmental literacy skills into any career field (Brundin 2023). Two impressive units included in this curriculum are biology/environmental science for high schoolers, and ecology for 4th graders. Both of these units included understanding ecosystem services, like those I mentioned in chapter 1, exploring the landscapes of Colorado, and how we can conserve and preserve these ecosystems (Hartman 2023). The end of the high school unit called for students to take the role of environmental consultant to make a recommendation on land-use practices to a group of public stakeholders (Hartman 2023).

Vermont and Delaware are also taking leadership roles as 'green' states, working to educate students outside of the classroom immersed in nature. Vermont aims to provide opportunities for children, families, and adults to connect with nature through independent natural immersion programs, developing outdoor skills, forest preschools, and nature-based education in K-12 schools (Vatovec 2022, 3-4). Although nature immersion programs have very limited capacity (about 6 students), they allow students to really maximize their time spent outdoors and children often value the environment and work towards sustainability more than their counterparts as a result of this program (Vatovec 2022, 5). Other environmental programs, such as nature-based education in schools and forest preschools, are much more accessible for students. Vermont has also introduced two No Child Left Inside bills into the state senate, one in 2008 and one in 2022. The 2008 grant program approved funding for student's environmental education, focusing on organizations that encourage students to be outside in socially sustainable

ways. This program was widely successful, with a huge increase in students spending time outside during the school day and a wide array of nature-based activities gaining funding (Vatovec 2022, 14). The act of 2022 was introduced into the Senate but unfortunately has not yet advanced (Vatovec 2022, 14). Delaware established that October would be known as the Children in Nature Month in 2014, and in 2016, the Environmental Literacy Committee of the Delaware Children in Nature Coalition completed Delaware's Environmental Literacy Plan, which was signed by the Department of Education and meant to support educators in implementing climate change education into the classroom ("Delaware Communities In Nature - DAEE Online" 2023). The Delaware Children in Nature Coalition has since been working to support more intensive nature programs in schools.

These state programs are a sharp contrast to Pennsylvania's environmental education policy which earned an F on the scale, and in every single different category. Pennsylvania currently lacks any mention of climate change in its state education standards, and the standards are about 20 years old ("Making the Grade?" 2020, 18; Shelley & Niepold 2020, 3). Thankfully, they are said to be reviewing these standards as of 2020.

Environmental Policy and Education at the City level. While a lot of schools and teachers are unable to provide extensive and comprehensive environmental education, some schools have actually worked to make climate change learning a priority. Two specific schools in Denver, CO have taken the initiative of going above and beyond the state standards of Colorado that I discussed in the last section. Some of my friends and the children I nannied back in Denver attended the Logan School, a private school known for its integration of hands-on environmental learning into its curriculum. Students at the Logan School get plenty of experience outside, with extensive recess, field trips, overnight field trips, and 'lab work days' where students of all ages

have the freedom to investigate an aspect of the environment that they are interested in. Another school in Denver, Peak to Peak Charter School, includes a unit where students are challenged to design a sustainable product that 'may one day change the world' using recyclable materials. This type of optimism encourages students to think creatively and critically about how they can tackle real-world issues.

Burlington schools took the No Child Left Inside movement a little more seriously than most cities; they are working towards ensuring that students are able to spend a lot of time outdoors exploring the natural world. Since the city is surrounded by natural woods, schools utilize this area as natural laboratories for science classes, measuring water quality and erosion, practicing map-making, learning ecology, and even growing pumpkins (Gawarkiewicz 2018). Some classes construct forts out of materials in the forest to foster collaboration and community, operate their own school composts, and visit neighborhood parks for designated nature time during the day (Gawarkiewicz 2018). These schools embody the nature study movement of a century ago that I discuss in chapter 2 (Gawarkiewicz 2018).

Some New York City schools are devoted mostly to environmental science education, like the High School for Environmental Studies (HSES) located in Manhattan. The school opened in 1993 and serves over 1,300 9-12 students today ("Mission and History | EnviroStudies.org" 2023). The school aims to integrate environmental education into all aspects of the school's curriculum while still preparing students for college and careers. HSES focuses on the UN's Sustainability Goals, offering electives that talk about environmental-related issues like environmental justice, fostering a rooftop garden and chickens, and a broadcast media studio focusing on environmental issues. The school partners with many environmental advocacy organizations, such as the Sierra Club and Student Conservation Association, to develop and

support students' environmental education. HSES emphasizes the need for applied learning and hands-on activities, hence the rooftop garden maintained by students, and the chickens also cared for by students.

The Political Debate on Environmental Education. As environmental education becomes more relevant in public K-12 schools and the demand for climate education increases in the United States, a debate arises as to whether or not environmental education should actually be taught to students. In fact, there have been quite a few policies introduced that attempt to prevent environmental/climate education in schooling or that push for 'teaching the debate' – the 'debate' being climate change denial.

Political stakeholders and players that shape environmental education policy are not just governments, but also entities like teacher/parent associations, lobbyists, and K-12 environmental education organizations. Lobbyists are a big one here. Blumstien defines lobbyists as the following

> Who and what are lobbyists? Typically they are political professionals gone private who represent specific groups of people for the purpose of legally influencing legislation on behalf of their clients. In America, as well as abroad, one might easily argue that the real power brokers are political lobbyists working outside the formal legislative structure (Blumstien & Saylan 2007, 120).

Lobbyists hold lots of power in the US's political system, and the groups that can hire them usually have a lot of money, like oil companies. Congressional assistants who write regulations are often getting their prose directly from lobbyists (Blumstien & Saylan 2007, 120). With campaign donations at an all-time high, many scholars argue that politicians no longer report to voters, but to whoever can donate the most to their campaign (Blumstien & Saylan 2007, 118).

Luckily, anyone can technically be a lobbyist. Environmental organizations can even teach people how to lobby their local government for more incorporation of environmental education.

Parents and parent associations are also political stakeholders that have great influence over environmental education curriculums. Many teachers report being pushed around by parents, worried about teaching students about climate change education in fear of backlash and potential consequences surrounding parent opinions (Maledone 2023). Moreover, some local school boards report that they have tried to remain bipartisan and neutral throughout this climate change debate, but 'vigilante' groups of parents are affecting this by lobbying local school boards or protesting certain decisions (Maledone 2023). There are many ways for parents to get involved politically, another example is that they can push for new charter schools in their community. Parents or any person in a given community can introduce charters, or contracts, by starting a charter petition. These charter petitions can campaign for environmentally focused charter schools that are open to all students.

Some entities driven by far-right conservatives and big businesses promote "climate change denial" and presumably don't want climate change education in schools due to economic incentives. Many powerful conservative groups use their influence to produce curriculums for students that emphasize the positive aspects of fossil fuels and include teaching doubts about the existence of climate change. These groups are funded by members of the fossil fuel industry and have a remarkable impact on education policy (Waldman 2023). For example, the Heartland Institute is developing a curriculum that frames climate change as a scientific controversy. In addition, in March 2017, they sent out their book *Why Scientists Disagree About Global Warming* and a CD to all K-12 science teachers in the US, intending for teachers to consider incorporating this into their curriculum. In Florida, not only diversity themes, like LGBTQ+, are

being banned from schools, but also climate change. This push for a climate change ban and denial is very dangerous for students and all people.

On the other side of things, Organizations like the North American Association for Environmental Education (NAAEE) who advocate for environmental education in K-12 schooling, also have some political influence. NAAEE recommends that students learn about the environmental processes and systems and how changes in these systems result in changes in another, whether that be by human influence or not. They also recommend that students learn about social systems having to do with the environment, like political and economic systems. They go further to explain that on top of this knowledge, students should learn the skills to address these issues, like planning and taking action and then evaluating the results of said action, otherwise known as setting goals or creating an action plan, a helpful psychological strategy I highlighted in chapter 3. NAAEE also attempts to get students and community members involved by providing guides on how to get in touch with local representatives, and community messages effectively, write op-eds, and set up legislative meetings (Slater 2019, 8-22). Another Organization, We Act for Environmental Justice, works to push bills to be enacted by Congress, providing transportation and food for those who want to join 'advocacy days' or lobbying days, Zoom meetings to educate participants about how to lobby for bills or environmental education legislation, and more information about the bill they are attempting to enact. Organizations like these can influence political action through community outreach and grassroots-type movements that can be very effective, as No Child Left Inside was. In the following chapter I will review these policies, debates, and ideas and make recommendations as to how we can better incorporate climate change education into K-12 schools.

Chapter 5. Redesigning Environmental Education Curriculum.

It will not be a simple fix to the broken environmental education system in the US, but as I have continuously emphasized, promoting optimism is a great start to empowering the next generation and combating the mental health issues and climate anxiety that students feel after learning about climate change. As I stated in chapter 3, students who learn environmental education with an optimistic framing are much more likely to spring into action than when fear framing and apocalyptic language are used. Climate change is a big problem that needs to be taken seriously by educators and politicians, but there is a way to emphasize and teach the importance and urgency of this issue without framing it pessimistically and causing immense fear and anxiety. I have mentioned briefly some specifics to consider when redesigning the environmental education curriculum in past chapters, like integrating climate change into all subjects and levels, teaching environmental education alongside social-emotional learning, and solution-based learning. These strategies promote optimism and have been shown to decrease rates of pessimism in students, in turn helping prevent mental health issues and climate anxiety. In this chapter, I will start by entering into dialogue about the policies currently in place that I described in chapter 4. Then, I will discuss strategies that schools and teachers can take to modify and add (or in the case of integration, redo) to their curriculums on climate change.

Government Policy. Before I dive into the policies I think should be added and put in place for environmental education in America, I'll discuss what is currently working and what isn't across the policies that I talked about in chapter 4. There are some states, cities, and schools that have pioneered climate change education, and although their policies may not be mainstream, they have worked in practice and deserve to be seen in all K-12 schools throughout the US. However, some states have not implemented quite enough strategies to promote an

environmentally literate citizenry, and the federal policies and regulations on environmental education are seriously lacking, and in some cases, moving in the wrong direction.

The attempt to address the deficit in environmental education at the national level is dismal. The standards and legislation are outdated and not keeping up with the quick pace of environmental degradation. While the attempts of some politicians to pass the No Child Left Inside Act were noble, it was one of the only somewhat recent legislation proposed to try to make environmental education in the US even remotely adequate. The implementation of the No Child Left Behind Act set climate change education further behind, moving it lower on the priority list to make room for rigorous reading, writing, and math curriculums based on high-stakes standardized tests. Since science was not as emphasized on these tests, environmental education was practically omitted from many K-12 curriculums. The federal government and people who influence legislative practices on the national level should work to incorporate the strategies I recommend in the following sections, whether that be to mandate them in schools or allocate much more funding towards developing these programs in schools. One good message did arise from national legislation: the impactful influence of grassroots movements. The push for increasing youth contact with nature after the publication of Richard Louv's book saw national political recognition, demonstrating to youth that there is power in these kinds of bottom-up movements.

Colorado's development of environmental education has surpassed the norm and set a great example for other states to follow. The collaborative efforts of different communities and educators proved to be successful in creating units designed to implement an understanding of ecological services, understanding of environmental degradation, and even including a segment of learning where students are to mimic the role of environmental actors. This last point is

especially important, as the problem of environmental education that I have continually emphasized in chapters 1 and 3 seems to be that it lacks a place for students to act, or at least feel hope that they can act. Allowing students to take on the responsibilities of what a real-life stakeholder would do to protect the environment helps students understand not only the legislative process but also shows students that they do have the power. I draw upon this education model in the following sections. Aside from the impressive conclusion of the biology/environmental science unit, there is still more that Colorado can do to meet the demanding needs of climate change education. Later in this chapter, I make some recommendations on why and how schools and states should be integrating climate education into every subject in the classroom, like the Logan School.

Vermont and Delaware have also demonstrated impressive progress in environmental education relative to the rest of the country. Vermont's initiative in immersing children and nature and promoting outdoor time is an aspect of environmental education that is important in supporting positive dispositions in K-12 students, as I mentioned in chapter 3. Some schools and cities have also demonstrated their commitment to ensuring that students have plenty of time and opportunities to be immersed in nature, and one NYC school even integrated environmental education fully into their curriculum. This aligns with what I recommend that schools should do below.

I recommend enacting a federal law concerning climate change in K-12 classrooms. This law would look like increased outdoor education for students, whether this be recess, science class, or gym class, students need to feel connected to nature around them in order to take action against climate change. In addition, the bill would require schools to review and adjust their curriculums to include meaningful climate change learning in all subjects. This learning would

include practical hands-on experience and social-emotional learning. We can model these practices after Austria and Latvia, who have both taken significant strides to better include environmental education in K-12 schooling (Hoodengdijk 2023). The Austrian Ministry of Education, Science, and Research introduced a decree emphasizing the need for nature exploration and an interdisciplinary approach to climate change, ensuring that schools teach climate change relating to all subjects (Hoodengdijk 2023). Similarly, the Environmental Protection Law in Latvia ensures that climate education is taught across all subjects in school and students use projects to raise awareness and take action to mitigate the effects of climate change (Hoodengdijk 2023). These are both successful examples of climate change being integrated into K-12 curriculums and if the US were to implement a similar law, it would expand awareness and action on climate change.

Teaching Environmental Politics. Promoting optimism and empowerment in this policy area in the scope of distrust in the government can be a tricky thing, but one solution could be to teach students about the legislative process, specifically regarding environmental protection. Because so many political concepts and processes in America are complicated and hard for a citizen to navigate without prior knowledge, students must learn about the political process to become environmentally literate. The democratic process itself relies on the fact that the citizens must understand all its complexities and how it works, and right now we are not teaching to that standard. This also paves the way for students to create their own action plans, an impressive psychological strategy I recommended in chapter 3.

In the case of lobbying, as I described in the above section, Blumstien raises a great point, saying, “If lobbyists can’t be beaten, perhaps they can be joined” (Blumstien & Saylan 2007, 124). Teaching students who have leverage and political power in the US government can

help them understand how they can work within the complex channels to promote environmental protection activity at the policy level. In chapter 4, I mention that anyone has the potential to lobby their local government, even students. Some lobbyists like this already exist, but currently, they are no match for the millions of dollars being spent by companies that aren't exactly environmentally friendly to persuade politicians a certain way. NAAEE is already teaching students and people how they can lobby the government, even providing informational sessions and transportation to governmental offices. The ultimate goal here in environmental education is to show that all people should be able to live under quality conditions and that the future of the environment and climate should not belong in the hands of powerful industrial groups; Thus, students can and should take matters into their own hands.

Civics courses can also involve students in community projects. This could look like getting engaged in the legislative process to inspire environmental action. Blumstein suggests some examples of what this could look like: pushing for the appropriation or development of municipal land for recreational use, banning nonbiodegradable materials in school cafeterias, raising awareness through artistic projects, or even contacting officials using media and community outreach to spark public pressure on politicians (Blumstein & Saylan 2007, 188). Such projects will teach students how to be involved on a policy level. I talk more about how to incorporate these types of projects in the following sections. Again, both lobbying and community projects are great examples of an action plan that helps to empower students and foster optimism in the face of an anxiety-inducing crisis.

Teaching environmental policy can also demonstrate the importance and influence of individual action. Students should learn about actions like the grassroots movement that led to the No Child Left Inside Act that I described in the above chapter. Learning about movements

like these that were relatively successful in raising awareness and inspiring action can show students that there is absolutely hope in mitigating and adapting to climate change, an important aspect of education that I have emphasized throughout this paper.

Integration Into The Classroom And Curriculum. I have reiterated a few times that climate change should not just be included in the science curriculum as is commonly thought, but should be integrated as a multidisciplinary subject. Climate change is a highly interdisciplinary subject, involving but not limited to reading, writing, math, and art, and it should be taught as such. Not only does climate change span across many different areas of the school, but sustainability and environmental solutions and action should be woven into the curriculum alongside it.

We can learn from the Indigenous practices I described in chapter 2. Native American cultures have relied on a complex understanding of the natural world, integrating this knowledge into almost every aspect of their lives. With this comes a deep respect for the environment, one that the white Western world needs to learn from. Simply adding environmental education curricula into national teaching standards is unfortunately not enough. Blumstien even goes as far as to suggest that ecology should be taught as the 'overall system to which we exist', and other subjects such as the economy as a subset of ecology, instead of how it is being taught today (ecology as a subset of the economy), we could reorient what is valued most from money to the environment promoting pro-environmental action, very similar to how Indigenous cultures treat ecology. (Blumstein & Saylan 2007, 178). Teaching this framework is essential for students to understand that what they buy determines what will be produced. If they can learn to create demand for environmentally friendly products and environmental protection, it will be produced.

As I outlined in chapter 3, spending time in nature and connecting to the environment are essential psychological strategies for fighting climate anxiety and improving environmental education. Integration of environmental education into K-12 curricula must include time and exploration of nature. The No Child Left Inside Act saw this need for child contact with nature but unfortunately failed to make it through the entire legislative process, as mentioned in chapter 4. Previously, I discussed the psychological importance of child contact with nature for optimism, development, and empowerment. This integration can involve exploring different habitats/ biomes, encouraging investment in nature in communities (bugs, plants, animals), and scavenger hunts outside (Blumstien & Saylan 2007, 183). It could also look like having science class outside, or even a longer recess. Further, having students attend a school garden, like HSES, is a vital strategy in fostering a connection with the environment which I will discuss more in-depth in section 3 of this chapter. Many schools and states that I mention in the policy review section of this chapter have recognized the pertinence of this issue and begun to incorporate more natural immersion into their curriculums, and other schools should begin to model their school days after these programs.

Emotional Learning And Climate Change. In the previous chapters, especially chapters 1 and 3, I shed light on the problem of increasing climate anxiety that can lead to mental health issues among K-12 students. Social-emotional learning is another important psychological strategy in combating climate anxiety and promoting optimism in environmental education. There is really no way to get around the sheer pressing gravity of climate change, but as I have said, we do not have to continue to foster this negative outlook and feelings of anxiety, instead we can acknowledge and work through these emotions productively and teach students skills to cope with these feelings. Emotions are a part of making sense of the world around us, and they

influence decision-making, learning, and actions; emotionality is the thing that motivates people to act and encourages behavioral engagement (Shepardson et al 2018, 45). Thus, understanding emotions and teaching emotional responsiveness to students alongside lessons about climate change can help us inspire and empower rather than beat down and spark fear. It works in practice too: one teacher who incorporated the emotional aspect of climate change in her classroom found that students were more engaged than they had ever been in that year and they were able to use the skills they learned to reflect and work through their climate anxieties (Lee 2023). On the other side of things, one study found that students who felt like their teachers weren't acknowledging their emotions were engaging in strategies like denial and distancing more than students who felt like their emotions were being respected by their teachers (Winograd 2016, 215). There are many ways to incorporate a social-emotional approach to climate change education in the classrooms, but I will highlight a few that have proven successful across the country.

Everyone has emotions, but not all of these emotions are conveyed, and understanding and knowledge of student's emotions are limited to what they express to us as teachers. We rely on conversation and communication to interpret and acknowledge emotions (Shepardson et al 2017, 44). This is why emotional expression should be an aspect of environmental education. Expressing emotions on climate change could open avenues for analysis and development of coping skills to handle that emotion if it were to be negative. Some younger students may not be able to identify the very specific emotion they are feeling after learning about environmental degradation, but even just identifying where emotion lies under an umbrella of a more general emotion like 'upset' can be beneficial because students can begin to understand some of the things known about that emotion and make logical sense of it (Shepardson et al 2017, 46). Not

only does encouraging students to express their emotions surrounding climate change help them begin to work towards coping strategies, but it can also foster community and solidarity, considering many of their peers are probably feeling very similar. I will discuss the importance of promoting this kind of community in the following section In addition, having students express their emotions after a lesson also helps teachers see how their students are emotionally connecting to climate change so they can adjust their instruction to promote optimism or reframe the issue if it is causing immense anxiety or negativity. Many techniques can be employed to allow space for students to express their emotions such as writing prompts, journaling time, discussions in groups or as a class, and graphic organizers. These questions and activities should include cues asking students to identify and elaborate on the emotion that they are feeling after a given lesson, or for younger students, pick the emotion they are experiencing.

It can be hard for educators to understand and teach the emotional aspect of climate change without proper professional development on climate change. Many educators cite a lack of resources and knowledge on climate change as one of the main reasons they feel that it's difficult to incorporate an emotionally comprehensive environmental education into the classroom (Vatovec 2022, 2; Maledone 2023; Brundin 2023). In chapter 3 I discuss the importance of promoting optimism and the psychology of how that helps students feel more engaged and can actually influence their ability to act. However, there is a gap of knowledge here where teachers aren't properly trained in this sector of educational psychology and therefore don't have the adequate skills to teach in a manner that capitalizes on students' positivity in the classroom. Teachers should receive training on how the educational psychology of learning that I discussed, because climate change is an extremely emotionally sensitive topic, and currently climate change education is causing immense climate anxiety among youth. This training could

potentially be incorporated into their education, for instance, a class in a college's education program that prepares future educators for the emotional aspects of climate change. Schools could also bring in psychologists on teacher work days, or over the summer, to prepare teachers for this emotional aspect.

School psychologists and school counselors are more trained and well-versed on how emotional learning benefits students, but as I brought up in chapter 3, many schools are understaffing their psychology/counseling departments leading to school counselors/psychologists taking on much more than they can handle. State legislators have introduced many bills proposing more funding in schools go towards security measures, directing resources away from departments that desperately need it, like psychology. I propose that we push state legislators to introduce bills that allocate more funding to mental health services in schools rather than security, so the burden of climate anxiety doesn't fall solely on teachers.

Solution-Based Learning. In chapter 3, I explained how goal-oriented and solution-based learning can promote optimism and engagement in lessons, and in turn, create motivation to act. Solution-based learning centers around measurable outcomes and setting perimeters to success. Solution-based learning for climate change can take many forms. Although I unfortunately cannot discuss all of the wide array of strategies available to better environmental education curricula, I would like to mention a few community-based action strategies that stuck out to me, have been backed with research, and worked successfully in practice.

School gardens have proven to be an effective tool for environmental education for various reasons, including the fact that they provide a means to learn about the environment and environmental responsibility in a hands-on way. School gardens allow students to work towards

a solution: a successful and blooming garden. Along the way, students pick up many other valuable lessons and knowledge. Gardens can help students understand the complete ecological cycle of growing food, broadening their understanding of the ecological services as a whole that I explain in chapter 1 (Blumstein & Saylan 2007, 111). Growing food can also help personalize the experience of nature for a child, showing that maintaining the diversity of plants and animals requires effort and human action, and furthering a child's connection to nature and the environment (Blumstein & Saylan 2007, 112). Through planting a school garden, students gain an understanding of application and analysis, and they may better see the need to find "new solutions to old problems" (Blumstein & Saylan 2007, 112). Further, gardens provide knowledge on environmentally friendly practices like waste management issues, composting, reducing, and exercising sustainability. School gardens are relatively inexpensive to upkeep and manage, and can benefit the school if the school begins to use the produce grown for school lunches. Not to mention they provide an avenue for contact with nature and being outside that promotes positive energy as I mention in chapters 1 and 3. Maintenance and upkeep can take place in the science curriculum that is already in place, as many curricula already require the learning of plants and the life cycle of plants. For those schools that do begin to integrate environmental education into all subjects, school gardens are also a great place for students to use writing, reading, and math skills!

One school created an environmental education program that included real-life examples of natural disasters and then allowed the students themselves to work through this issue and create solutions and mitigation strategies to help the communities and infrastructure affected by this disaster (Winograd 2016, 225). This program had students observe either a video, reading, or model of a natural disaster and create multilateral solutions to that problem (Winograd 2016,

225). They did this through collaboration with their peers, discussions, and tests on models. They also investigated what worked in the past for similar natural disasters (Winograd 2016, 226). Science curriculums should include activities like these so that students can see there is hope in helping those affected by the natural disasters that will inevitably arise due to climate change. Collective public efforts, like this collaboration of peers to solve issues created by climate change, have been shown to create positive attitudes about the future (Blumstien & Saylan 2007, 99).

Other methods of solution-based learning include walk-a-thon/bike-a-thon and career exploration. Walk-a-thons and bike-a-thons are days in which all students either walk, bike, scooter, or get to school using anything but a car. This shows students easy ways for students to act in an environmentally friendly manner. It also creates an opportunity for students to spend time outside and connect with the environment around them. Solution-based learning should also include career exploration that teaches and prepares students for job opportunities related to sustainability, environmental justice, and environmental policy. Although this would mostly be for students in high school, it never hurts to show that these opportunities are available in the world from an early age.

These changes may not come all at once, but it is pertinent for schools, teachers, and parents to consider the current failure of the environmental education system and how it is affecting their children, so we can begin to work towards a more hopeful and sustainable future. Students right now are carrying loads of excess stress, anxiety, and grief due to the current framing/ lack of climate change education, and it is our responsibility as educators, citizens, and moral people to address this issue as best we can. It will take more than just our teachers and schools to work towards a better curriculum, families, communities, politicians, and other

stakeholders need to get involved as well. In the meantime, we can continue to raise awareness of these issues and suggest solutions and alternatives to the current curricula.

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