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ANTHROPOCENTRISM AS AN ILLUSTRATIVE EXAMPLE OF HOW FOUNDATIONAL
EPISTEMOLOGIES UNCONSCIOUSLY AND CONSCIOUSLY IMPACT THE WAY WE
LIVE AND TEACH: IT IS NOT JUST CHANGING THE WAY WE *THINK*, IT IS ALSO
CHANGING THE WAY WE *ARE*

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DEDICATIONS

This thesis is dedicated to my wonderful Nanny and Papa, and my loving mom, who taught me how to fish and helped me fall in love with the lake; to my amazing dad for taking me golfing since I was three; and to my incredible girlfriend who has supported me and kept me laughing while I completed this work. I love you all and thank you for everything you have done and will continue to do for me.

Abstract

Climate change poses an immense threat to the planet and all life on earth, and yet in public education the environment continues to be an afterthought. The largely unnamed phenomenon of anthropocentrism is a driving force underlying why the environment has been largely ignored. Anthropocentrism is when people rationalize themselves as existing above other life and has become an epistemological basis for hierarchical thinking and domination. Meaningful environmental education works to name and dismantle how humanity places itself above all other living beings. However, meaningful environmental education faces immense opposition because of the dominant anthropocentric mindset in education and beyond. That mindset goes unnamed in the educational discourse but is an integral part of the discourse itself. Therefore, there is resistance when critiquing the anthropocentric mindset and imagining new alternatives and possibilities. As a result, public education currently perpetuates and protects anthropocentrism.

This critical qualitative study explored how the difficulty of naming anthropocentrism manifests in K-12 education to create obstacles teachers face when trying to teach about the environment in meaningful ways. First, I examine the concept of anthropocentrism, why meaningful environmental education works to name and critique the phenomenon, and how K-12 education currently fails to do so. Second, I will explain the theoretical lens that I used to examine the data where I emphasize the importance of naming our obstacles and the power of discourse based on the work of Maxine Greene and Michel Foucault. Third, I detail the methodology and introduce my participants. Fourth, I share what I found and apply my theoretical lens to my analysis of the data. Finally, I discuss the possibilities available once anthropocentrism is named and a part of the discourse.

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Chapter One: Introduction

My name is Aaron Cavazos, and I was a 23-year-old graduate student at the time I wrote this thesis. I grew up in Oklahoma, the same state where I was born, and I lived there all my life. From a very young age, for as long as I can remember, I have loved nonhuman nature and being outdoors. My grandpa and mother taught me how to fish at the age of two, and my father taught me how to golf at around the same age. I loved that I got to be outside for both activities, on the water or in the grass. Also, ever since I was allowed a television in my room, I have been obsessed with watching *Animal Planet*, the *Discovery Channel*, and any channel that had nature documentaries. I consumed any and every show I could find that talked about life and nature.

Today, I find peace and calm when I am outdoors, a tranquility that I can never find indoors or in the city. My favorite place in this world is at a lake on a warm sunny day. I have never lost my affinity for the outdoors, or fascination with all living things. I miss the days of my childhood when I could go outside and play without a care in the world, just enjoying the yard, the air, the feeling of wide-open space. For a while now I have had too many responsibilities, too many things that required an internet connection and a screen, that prevented me from being outdoors. This weighed on me often and still does. I thought it was “just a part of growing up.” However, I have begun to understand the absolute connotation implied with that statement, and I have realized things could be different. I began that understanding in my undergraduate courses, and I desperately tried to understand more in my graduate courses.

Growing up, my fascination with nature and life was always extracurricular. Very rarely did I ever learn anything in school that was about any other life than humans. In my biology class in ninth grade, I learned about different cells, and I learned a little about biomes and climates in my geography classes. But I seldom learned anything new that I had not already seen

on the *Animal Planet* or *Discovery Channel*, or that I did not see while playing outside. My high school did not offer an environmental science course, or I would have taken it. I intuitively knew there was more about nature out there somewhere, but I did not know where to find it, and I was not finding it in school.

I never lost my interest in the environment, but without it being cultivated in school, the subject I became most interested in was social studies. This started with geography, with memorizing the states and learning of different places around the country in the fourth grade. In fifth grade, United States history grabbed my attention, learning about “explorers” and the Revolutionary War. From then on, my favorite subject was social studies, with Advanced Placement (AP) World History being what finalized my interest. In other subjects I was just trying to get good grades, but my social studies classes were the classes I enjoyed going to school for. I now had an in-school interest of social studies, and the extracurricular interest of the environment. These two interests would be combined in college.

I went to an agricultural university for all four years of my undergraduate degree. I was an honors student and did well in my courses. I entered college as a business major, for that was what I felt was expected of me, but I had little interest in it. I only lasted a semester before switching majors to pursue a history degree after taking some underwhelming business courses but a very interesting cultural geography course. The next semester I took entomology, which was easily one of my favorite courses I took in college. It was all about insects, where I focused on nonhuman life, and it was the first time my interest in nature was truly represented in a class. I even considered switching majors again, this time to biology, but my advisor told me of the types of geography courses I could take, and that there was even environmental history I should consider.

I ultimately decided to stick with history, but I still wanted to learn more about the environment, so I decided to take environmental history along with conservation and historical geography courses. I loved learning about the history behind how humanity has been changing the environment, the history of conservation and the national parks, and the history of people interacting with the environment. All these courses were finally a combination of my love for the environment and my interest in social studies. While I previously thought these passions could not combine, once they did, I have never been able to separate them again. These classes made me want to join the National Parks Service, so I worked with my advisor to create an environmental history degree. I did this so I could remain a history major while also learning about the environment.

The degree we created consisted of an honors bachelor's in history with an environmental studies certificate alongside it, essentially a minor in environmental studies. I took more classes for the new degree I was creating, like physical geography, global studies, and three economics courses with one being an environmental economics course. In my history courses, my papers focused on environmental history like the desertification of Ancient Mesopotamia and pollution in industrializing Britain. My culminating thesis, which was my thesis for my honors history degree, focused on the history of the Bengal tiger in India during British colonization.

In the process of finishing up my bachelor's and preparing to join the National Parks Service, Covid-19 hit the United States, and, like many, my plans were significantly altered. With the pandemic in full swing while I was finishing up my undergraduate degree, my plans of entering the National Parks Service changed. Lockdowns closed all national parks and so I decided to pursue another path I had also been considering, becoming an educator. I was not certified to teach and with school being virtual I decided to pursue a master's in social studies

education while waiting for things to “return to normal.” I selected a dual program where I would be obtaining my master’s while also becoming certified to teach. I entered the program with a background in, and passion for, environmental history, and I hoped to learn more about how to teach about the environment. As I started the program, however, I began to realize why it was not until college that I learned about the environment in a school setting.

My first class in my graduate program was an introduction to the program where we read literature and practiced creating and teaching lessons. I was nervous and felt underqualified, not having much teaching experience besides a couple opportunities to teach in K-12 classes through my time as an undergraduate. When it was my turn to teach a lesson in this graduate course, I decided to teach something with which I was comfortable and did my lesson on the history of systematic eradication of the American Bison. My lesson went well, and my professor was interested in my topic, but none of my peers had lessons about the environment, except for a third-grade lesson on bees. This was only my first class in the program, but I began to see how my interests in the environment were not shared amongst my peers, at least not outwardly in class or the lessons they created.

I went into my future classes continuing to create lessons about the environment, lessons over the effects of the fur trade on beavers and the differences between the farming practices of Latin American civilizations and European farming practices. As with the first class, I again noticed the rarity of lessons on the environment. As I progressed in the program, I came to the point where I was student teaching in a class once a week and was getting to create and teach my own lessons. I expressed a desire to try my fur trade lesson in the class, a lesson I designed to help students empathize with the American beaver during the fur trade. However, my mentor teacher told me she did not think it would be a good idea because she thought that the students

would not be able or willing to empathize with beavers. I listened to her, but I thought it was significant that a lesson focusing on nonhuman life was scrutinized and thought to be a bad idea. Throughout my program, I continued to see an absence of the environment as a focus of my peers, and now I saw an absence in my first field experience. This left me with many questions, questions that I explored further in my program and continue to explore in this thesis.

My peers were bright and inquisitive people, many of them critical and having the desire to learn about and combat systemic issues. My peers focused on critically addressing systemic issues such as racism, sexism, homophobia, white supremacy, and other systemic issues. However, climate change, envirosocial inequality, mass extinction, etc. were not issues that anyone but me addressed without being prompted. Those issues were being introduced and explored in some of my graduate classes, particularly by my professor whose research focused on those issues. Yet, none of these issues were being seriously explored as topics for lessons, articles, or research projects. With environmental issues, especially climate change, ever present in our world and threatening everything, why were so few trying to learn how to teach about those forces?

This question can be extended beyond just my graduate program experience. As I have explored this question, I have looked for literature to help explain why others seem to lack academic interest in these topics, or why others have not designated them as something to at least explore further. However, when searching through many of the top social studies journals, such as *Social Education*, *The Social Studies*, and *Theory and Research in Social Education*, I found very few articles that addressed environmental education. This prompted me to explore science journals as well, such as *Science Education*, *Science and Education*, and *Cultural Studies of Science Education*. More articles appeared in these journals, but very few discussed the systemic

issues beyond presenting technological solutions to surface level environmental problems. There were very few academic articles that critically examined environmental issues, with even fewer talking about critical environmental education.

In my experience, growing up with an interest in the environment and a desire to teach environmental education, I have noticed a lack of meaningful environmental education in secondary education, especially regarding climate change and humanity's role within it. I barely encountered any focus on the environment in my K-12 schooling, with my interest in the environment being cultivated outside of the school setting. It was only when I got to college that I began learning about the environment in school, and even then, I had to "create" an environmental history degree because it was not offered. As I transitioned into my graduate program, I did not see my peers interested in environmental education, and I found it difficult to find critical literature about environmental education. In searching for *why* there was a lack of meaningful environmental education, I became aware of the concept of anthropocentrism.

This study revolved around naming and critiquing anthropocentrism's role in perpetuating human domination and preventing meaningful environmental education as an illustrative example of how unnamed forces in general can affect the ways we live and teach. By looking at the example of the often-unnamed phenomenon of anthropocentrism, I hoped to illuminate how other phenomena that go unseen or uncriticized influence our thoughts and actions in hidden or unrecognized ways. Recognizing this could also be helpful when examining how unseen influences lead to the perpetuation of other systematic issues such as racism, sexism, homophobia, xenophobia, and more. The insights I have gained in my thesis by examining anthropocentrism could then lead to reimagined ways of thinking and being that are healthier and more respectful for all life.

Anthropocentrism is a worldview in which humans see themselves as separate from the natural world; and when humans are separated from the community of life, a hierarchy forms with humans above all. Anthropocentrism underlies the dominant economics, power structures, historical and scientific narratives, languages, and major religions of the western world (Houser, 2023). It is a worldview that is protected and held sacred, and it expands across multiple international and cultural borders. Anthropocentrism is often unexamined, and it can be a difficult concept to understand unless one is exposed to it and receptive to reflecting on how the worldview affects their perspective(s). Once the concept and problematic nature of anthropocentrism is understood, truly understood, it can cause one to reexamine society and the world around them. It was not until I read a book titled *Ishmael* that I finally began seeing its far-reaching effects.

In the story *Ishmael* by Daniel Quinn (1992), an unnamed man confronts anthropocentrism and truly sees it named, with its implications seen throughout history and today. The unnamed narrator learns of two types of people, “takers and leavers,”¹ and explains them as such: “The premise of the Taker story is ‘the world belongs to man’. ... The premise of the Leaver story is ‘man belongs to the world’” (Quinn, 1992, p. 239). Within the novel, Takers believe that humanity is above the community of life, and the Leavers believe that humanity lives within the community of life. Humanity is no longer an all-encompassing term, for not all of humanity believes they are above the community of life; only Takers do. However, the Takers have consciously, and unconsciously, pushed their anthropocentric worldview on the Leavers through war and domination (Quinn, 1992). The anthropocentric Taker worldview is not sustainable, and it is leading all of humanity, not just the Takers, to their demise.

¹ Which the author Daniel Quinn acknowledges as generalizations simplified for the purposes of illustration.

Daniel Quinn wrote other books called *My Ishmael* (1997) and *The Story of B* (1996) that expanded on the ideas presented in *Ishmael* and further demonstrated how anthropocentrism permeates through religious, historical, and scientific narratives. These books are thoughtful novels rather than peer reviewed academic articles, and they innately set up a dichotomy of “Takers” and “Leavers,” but they have done more for me in understanding anthropocentrism, its dominance, and the plethora of problems that accompany its dominance, than anything I have previously encountered. They are outside of the academic world, but the professor who presented the books had to look outside of the academic world because of the lack of accessible discussion around anthropocentrism within the social studies discourse. Through reading these books and deeply considering their central ideas, I have begun to see the world in a very different way, allowing me to make connections I have never been able to make before.

The most profound connections I have seen are how anthropocentrism prevents alternative ways of thinking about the environment by devaluing all other life, and how it is the unspoken justification for the exploitation and continued destruction of the planet (Mackie, 1998). Because most of us see ourselves as existing above the remainder of the community of life, we live in unsustainable ways that reinforce the hierarchy of humanity over nature, instead of humanity *as a part* of nature. We then fail to coexist with the environment and continually move closer and closer to our own destruction. This perception of man over nature is dominant even when we are trying to address climate change and other environmental issues. Ultimately, these

dominant ways of responding to ecological precarity remain tethered to human exceptionalism and to individualized discourses of “saving the planet” that do little to shift underlying settler colonial and racial capitalist relations that drive climate crisis...

Centering relationality requires undoing extractive relationships to more-than-human beings including land, animals, plants, and more” (Nxumalo, Nayak, Tuck, 2022).

The anthropocentric perspective is prevalent in social studies education as well. One place this is evident is in the *College, Career, and Civil Life (C3) Framework for Social Studies State Standards* (National Council for the Social Studies [NCSS], 2013), where the nonhuman environment is constantly referenced as being separate from the human world. Looking at the geography section of the *C3 Framework*, where the environment is most discussed, there is a dichotomy present that distinguishes the human world from the natural world (NCSS, 2013). This is most evident in the section about human-environment interaction. The *Framework* states, “Earth’s human systems *and* [emphasis added] physical systems are in constant interaction and have reciprocal influences flowing among them” (NCSS, 2013, p. 42). While there is an acknowledgement that we interact with the environment, the text still separates humans from the environment, suggesting that human systems are separate from the physical systems of nature.

Within the Oklahoma State Standards, the dichotomy separating humanity and nature is ever-prevalent. The Oklahoma State Standards for Social Studies “are derived from the major disciplines of the social sciences: history, geography, civics and economics” (Oklahoma State Department of Education, 2019). Those four major disciplines are defined in the *NCSS C3 Framework* (2013), the national suggested framework for states to follow. The justification for why the four disciplines are taught in social studies is, “the four core disciplines within social studies provide the intellectual context for studying how humans have interacted with each other and with the environment over time” (NCSS, 2013, p. 29). This further establishes the dichotomy that separates humans from the environment and provides the intellectual context from which Social Studies education is derived, an anthropocentric context in which humans are perceived as

existing outside of the rest of the community of life. It becomes very difficult for educators to even recognize the problem, for it is embedded in the very ideas from which Social Studies education is derived.

Anthropocentrism is often unnamed and unexamined, and it is hidden from even the most well-intentioned educators. Social Studies education is often taught with the goal of developing informed citizens that further democracy, but this development typically takes place without considering the broader ecological contexts in which all humans exist (Houser, 2009). Social Studies has extensive standards, and yet those standards mostly exist outside of the ecological context, and they often promote the anthropocentric perspective that humanity is separate from and above the natural world. Standards have become heavily pushed on teachers across the country with the rise in accountability culture in the United States; and that culture leaves little room for anything to be taught beyond what is found in the standards (Bailey et al., 2014). Since those standards often come from, and are taught by, people who knowingly and unknowingly perpetuate anthropocentric perspectives, anthropocentrism remains dominant within our public schools.

Social Studies education needs to occur within an ecological context, but this is challenging because educators in the current anthropocentric context are not encouraged to break down hierarchical thinking and meaningfully teach about environmental issues. Hierarchical thinking is an epistemological premise for problematic ways of thinking like racism, sexism, xenophobia, homophobia, and other ways of thinking, that justify placing people over one another (Nxumalo et al., 2022). The idea of “supremacy” starts with human supremacy, and “human supremacy is intertwined with, and constructs, white supremacy. This means that human supremacy entitles human beings to turn all other life into natural resources for our own

consumption and extraction” (Bang, et al., p. 151, 2022). Breaking down hierarchies and meaningfully teaching about the environment should happen simultaneously.

Many people are aware of how immensely problematic it is to place people over people, but few are aware that this way of thinking is derived from people placing themselves above nature. It begins with applying the justifications that people have historically used to place themselves above nature to other people as well. Few people see how the two are related, because we have learned to think of humans and the environment as separate and distinct rather than as inseparable aspects of an indivisible whole (Houser, 2023). To meaningfully break down hierarchical thinking, we as educators must start to see ourselves as interconnected with the world and resituate ourselves within the community of life.

After researching social studies education to find how and if the environment was taught, I then turned to science education. I started with the standards as I did with social studies. There were many more spaces where a science teacher could incorporate meaningful environmental education, mostly in the life sciences, but the standards were still limiting. I saw that the science standards did not support meaningful environmental education because they were heavily based on learning scientific processes without studying how those processes existed in relation to the world (Oklahoma State Department of Education, 2020). The standards also often encouraged the separation of humans and nonhumans, as seen by standard “ES. ESS3.1 Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate [affect] human activity” (Oklahoma State Department of Education, p.152, 2020). Looking holistically at the standards, the dichotomization of humans and nonhumans was ever present, and the interconnectivity of life was broken down into

different systems to be taught separately and in a vacuum, without connection to how those systems interact and exist within the world.

Science education is largely taught through a reductionistic western perspective, under which people categorize and separate living beings and systems. This science's philosophical origins are tied to rationality. This way of thinking dates at least to Aristotle, where he established that humans are separate from nature because of their rationality. This rationalized justification for anthropocentrism led to humans being privileged when considering ethics, with Judeo-Christian beliefs building upon these ideas of man over nature (Andrew & Robottom, 2001; Nissiotis, et al., 2013). This ethical privilege, in combination with the exclusion of nonhuman life from ethical considerations, has led the field of western science to be built upon the domination and exploitation of nonhuman life.

The foundations of western science and anthropocentric ethics drive much of K-12 science education. Public science educators often rationalize and deconstruct the natural world, which negates humans' relationality and interdependence with other life (Lee, 2021). There is also a lack of explicit recognition of nature, human and non-human interrelationships, and the notion of sustainability for nature's sake (Darren, 2020). Science education has more space than the social studies for meaningful environmental education, but the predominant way the environment is currently focused on often perpetuates and reinforces the anthropocentric worldview.

Public science education needs to occur within an ecological context because science educators commonly teach a form of science where students observe the natural world and conduct experiments for human benefit without consideration for nonhuman life (Rautio et al., 2022). The absence of consideration for the natural world reinforces the anthropocentric mindset

that the earth exists to be exploited by humans. Further entrenching the anthropocentric mindset in science education leads educators to promote shallow technological innovations that concentrate on economic growth and only worsen ecological crises (Mueller & Bentley, 2006). Public science educators who do little to promote the conservation of earth's natural environments in their teaching worsen the climate crises as more aspiring engineers and scientists enter their fields without considering the natural world and its living systems (Mueller & Bentley, 2006).

Solutions to environmental challenges, such as climate change, that are created under the anthropocentric western scientific worldview often fail to solve the problem of people thinking they rule over nature. The premise that humanity is separate and above nature is an incomplete and limiting premise that places the planet beneath humanity. Humanity is not above the community of life, not the rulers of the world, not the life form that the planet revolves around. Solutions to climate change that base themselves on this premise then become discussions of how to better manage resources, how to find ways to give water and air a market value, or how to design technology like carbon filtering that attempts to do what nature has always done. The community of life is not a list of resources to be categorized and exploited (Mueller & Bentley, 2006). Mismanagement of resources and the lack of market values are anthropocentric diagnoses of environmental problems. There needs to be a paradigm shift in climate change solutions, one that moves away from anthropocentrism towards a reconnection with a living planet.

There needs to be a paradigm shift towards teaching social studies and science education from an ecological context. Only a paradigm shift away from an anthropocentric worldview towards an ecocentric paradigm can lead to the imagining of environmental solutions that can save the planet from further destruction (Mackie, 1998; Nelson et al., 2021). This paradigm shift

should include resituating ourselves within the community of life. For humanity to resituate into a more ecocentric relationship with life, two crucial aspects of deep ecology need to be striven for by educators: one, ideas of community need to be extended beyond the immediate to include all life, and two, all life has a right to live and blossom (Devall & Sessions, 1985). Social studies and science teachers can be powerful agents in pursuing and implementing these paradigm shifts.

Working toward a paradigm shift in education is a monumental task, but luckily, we have multiple starting points, for there is no need to invent a whole new way of thinking. Worldviews where people situate humanity within an ecological context exist, and they have always existed (Deloria, 1995). For example, there are the “Leaver” stories in Quinn’s novel *Ishmael*, where people lived in coexistence with nonhuman life (Quinn, 1992). The “Leaver story” can be found in Indigenous cultures and knowledge today. Indigenous knowledge in this context is derived from ecocentric worldviews, where people place humanity within the community of life (Simpson, 2004). In the United States, we can look to Native American philosophies for guidance on how to reconnect. However, in so doing, it is essential not to appropriate Indigenous knowledge and perspectives, further extracting others’ resources for one’s own benefit.

Many Indigenous epistemologies exist as counternarratives to the dominant narratives, perpetuating anthropocentrism. In *Red Alert* (2009), Daniel Wildcat explained how many Indigenous worldviews are based on relative relationships instead of the dualities commonly found in anthropocentric worldviews. Seeing the world in terms of relative relationships allows for a more ecocentric view of the natural world where respect for all life is central. Humanity’s position in relation to all life becomes one of greater equality instead of hierarchical privilege that places people over all else. The natural world is no longer viewed as a list of natural resources, but rather a living community consisting of equal beings that humans need to coexist

alongside with (Wildcat, 2009). Many Indigenous worldviews are more ecocentric than anthropocentric, contradicting the dominant narratives currently emphasized in public education.

Education coming from a more ecocentric place looks different than education derived from anthropocentric perspectives. This is exemplified in Vine Deloria and Daniel Wildcat's (2001) *Power and Place: Indian Education in America*. In this book, the authors envision what education would look like if it was grounded in Native American ideas of power and place, with power being "the living energy that inhabits and/or composes the universe," and place being "the relationship of things to each other" (Deloria & Wildcat, p. 22-23, 2001). "Power and place produce personality," with personality being "the substantive embodiment, the unique realization, of all the relations and power" that are emergent in a given place (Deloria & Wildcat, p. 145, 2001). This proposes the relationship between people and the natural world as personal, thus encouraging behavior that takes into consideration the consequences of one's actions and ensures complete relationships with other living beings. The aims of education proposed by Deloria and Wildcat are ecocentric and centered around respect and coexistence as opposed to the anthropocentric aims of subjugation and exploitation (Deloria & Wildcat, 2001).

Native American philosophies are spaces where worldviews promote coexistence and interconnectedness with the natural world. Despite colonialism and systematic attacks by dominant forces such as White Supremacy and Christian missionaries, those spaces still exist today (Simpson, 2017). People have previously looked toward Native American philosophies but have often done so with a reluctance to relinquish their own dominant worldviews to approach these philosophies. If someone with a dominant worldview does not relinquish control, they form extractive relationships with Indigenous knowledge and perpetuate problematic hierarchies (Simpson, 2004). It is important to be guided and inspired by Indigenous knowledge and Native

American philosophies, to see possibilities for change, but not to take these ideas as being one's own. With the knowledge that the dominant western anthropocentric worldview is not the sole worldview, and that many other valuable worldviews also exist, we can move towards meaningful environmental education that acknowledges there is more than one right way to live (Quinn, 1992). Once this is acknowledged, educators can start finding concrete ways to bring meaningful environmental education into the classroom.

I define meaningful environmental education as education that works to dismantle the hierarchical thinking where people place humanity above all other living beings. Educators need to learn to name anthropocentrism for themselves, to find ways to critique it, and then to present alternative ways of viewing the world (Ho, 2022). Once educators do this work, students can also begin to imagine new ways of living that are more respectful and healthier for the planet. One powerful factor that prevents people from recognizing and critiquing anthropocentrism is that it goes unnamed and is thereby consciously and unconsciously perpetuated by public educators as the only way to live. Presenting past and continuing alternative worldviews directly opposes the fallacy that anthropocentrism is the only way to live. Although many ecocentric alternatives have been intentionally and unintentionally erased and misrepresented throughout history, they are not all gone (Said, 1994; Eagleton et al., 1990). By showing there is more than one way to view the environment, more than one way to live, space can be opened for the pursuit of new paradigms of coexistence.

Meaningful environmental education strives to reconnect us with our surroundings and to resituate people within the community of life. Once people are resituated within the community of life and relinquish their position as the rulers of the world, solutions can be created to combat environmental destruction and work towards greater coexistence. Sustainable solutions and ways

of life are those that strive to work with natural systems rather than attempting to manipulate and dominate those systems. Education could play a pivotal role in working towards living within the planet in a way that will not destroy the earth and all the life that lives on it. However, in most cases, such education is not occurring even now at this critical juncture.

Given these important concerns, the purpose of this critical qualitative study was to explore how the difficulty of naming anthropocentrism impacts social studies and science teachers who wish to teach about the environment in meaningful ways. Toward this end, I asked the following questions of four educators who strove to implement environmental education in their classrooms:

1. What were the obstacles you faced when trying to teach about the environment in meaningful ways?
2. How did you cope with those obstacles?

Chapter Two: Interpretive Lens

There were two ideas from theorists Maxine Greene and Michel Foucault that I combined to help explain what I discovered in my findings. The first idea was that alternative possibilities cannot be recognized without first explicitly identifying or “naming” the obstacles to those alternatives (Greene, 1988). The second idea came from Michel Foucault, who explained that discourse often dictates what can be known, and therefore what can be discussed, in different settings (Foucault, 1972). My interpretive lens involved understanding how these two ideas interacted with each other when it came to applying this to my findings related to anthropocentrism and environmental education.

Maxine Greene’s (1988) *Dialectic of Freedom* asserts that in the United States there is an incomplete perception of freedom. People see freedom in individualistic, negative terms, such as freedom from government constraint and community responsibility. According to Greene, those who promote capitalistic and libertarian thinking influence these incomplete perceptions (1988). In turn, people perceive freedom as consisting of laissez-faire economic policies and isolationist social and political policies. These notions of freedom do not serve the common people, for they prevent us from recognizing our own individual and collective oppression. Greene proposed that people need to stop seeing freedom in negative terms, as “freedom from,” and thus as an entitlement to disengage from their communities. Instead, she proposed that we need to see freedom in positive terms, as “freedom to” work together to achieve real communities and social conditions that benefit and validate all. Therefore, according to Greene, freedom should be viewed as a collaborative achievement, within a lived social condition, rather than an entitlement to avoid personal growth and communal responsibility.

Greene (1988) argued that notions of negative freedom in the United States alienated a sense of community and collaboration, which created a situation where people could become blind to the obstacles that prevented them from achieving alternative possibilities. To move towards a collaborative and achieved freedom, people needed to first name the obstacles, for in the naming of the obstacles alternative ways of living were conceivable. Without naming the obstacles, these alternative ways of living were even more challenging to imagine, much less to enact (Greene, 1988).

I applied Greene's idea of the importance of naming obstacles to imagine alternatives to this work on conceptions of reality around environmental issues and climate change. Like Greene's concerns of how negative perceptions of freedom were unconsciously assumed, anthropocentrism often goes unseen and unnamed, thus preventing the conception of alternative ways of living and being in relation to the natural world.

Our anthropocentric context places humans at the center of the ecosystem, at the top of the hierarchy, and separates humanity from the natural world (Nxumalo et al., 2022). For many people, the trajectory of environmental destruction and the mass loss of life is accepted as a given, as an objective result of "human progress" (Houser, 2023). Most people cannot perceive a different reality where humans live within the natural systems in ways that coexist with the planet instead of attempting to dominate it. As a result, solutions to environmental issues reflect incomplete ideas of sustainability that assume humanity can manipulate and bend the world to its will. The anthropocentric perception of sustainability prevents the creation of deeper solutions keeps many people from seeing environmental education as worthy of discussion. Without naming anthropocentrism as a problem, we cannot critique what we do not know. Conversely, understanding what is known requires looking at Foucault's idea of discourse (1972).

Michel Foucault's (1972) idea of discourse describes how social systems produce knowledge and meaning through the language people use. According to Foucault, an object's meaning is derived from the series of relations that form from the words used to describe the object (Foucault, 1972). This extends into ideas as well. The series of relations then shape what is known about the ideas themselves, and they become "social fact" through a progressive acceptance of the discourse. This acceptance is produced by the power within a social order, for people with authority often decide what ideas are "social fact" and which are false. Knowledge being determined by people of authority and the capacity of the discourse to produce knowledge and meaning is masked by historicity (Foucault, 1972). Historicity is the idea that continual use throughout history legitimizes an idea or knowledge, and when people in authority portray discourse as historical and scientific truth, a sense of objectivity develops (Foucault, 1972). Through this portrayal, the discourse becomes institutionalized.

Anthropocentrism became institutionalized as a worldview largely through discourse. The anthropocentric context was the context under which the dominant languages of the discourse were developed. The series of relations and assumptions that have been used to describe what have come to be viewed as objective truths has occurred over thousands of years within an anthropocentric context (Houser, 2009). Thus, over time, the anthropocentric perspective has become social fact, legitimized by those with authority derived from social power that has its origins in the hierarchical thinking that accompanied anthropocentrism itself. Because anthropocentrism is now considered social fact, it is seen as objective truth, and it continues to be perpetuated by dominant historical and scientific narratives. This perpetuation has institutionalized the anthropocentric perspective. Therefore, challenging anthropocentrism means challenging the institutions with which the discourse has become entwined.

The institutions of social studies and science education are among the things that would be confronted when challenging anthropocentrism. Both social studies and science education consist of discourses that often perpetuate the anthropocentric perspective (Kimmerer, 2013). They contribute to the historicity of anthropocentrism and the delegitimization of ecocentrism through the historical and scientific narratives embedded within their educational discourses. History is mostly taught as a linear story of unquestioned progress, starting with the agricultural revolution and leading to the present day (Oklahoma State Department of Education, 2019). Science is largely taught as a process of identifying objective truths of the world and applying them through technology to enact humanity's will (Oklahoma State Department of Education, 2020). Educators adhering to these discourses consciously and unconsciously reproduce objectivism, absolutism, dualism, and binary ways of thinking and being. We as educators who adhere to these discourses rarely consider the environment as having agency, and we often elevate humanity above all other life.

The linear and objective discourses of social studies and science have evolved for centuries, as part of western thought in general, beginning at least as far back as Aristotle, reinforced through the thinking of Descartes and other influential Enlightenment and Scientific Revolutionary thinkers. In *The Turning Point*, (1982) Fritjof Capra described this as a time of mechanized thinking, of separation, of standardizing the complexities of the natural world to fit the scientific and philosophical thought of the age (Capra, 1982). During the Enlightenment, philosophers sought to uncover universal truths that they believed would explain life; and throughout the Scientific Revolution, scientists worked to identify and apply universal laws in an effort to explain nature. During these periods, philosophical and scientific thought were influenced and reaffirmed by one another. Due to the connected nature of these intellectual

movements, they will be... jointly referred to as the Enlightenment throughout the remainder of this report. Since anthropocentrism was an underlying epistemology of Enlightenment thinkers such as Descartes, Bacon, and Newton, anthropocentrism was ingrained in the scientific and philosophical thought of the time (Capra, 1982).

The Enlightenment occurred simultaneously with European colonization throughout the world. Europeans spread, and often forced, their western epistemologies upon the environments and people they were colonizing. During, and since, the Enlightenment, those western epistemologies were continually justified by scientific thought. Through exploitation, enslavement, genocide, and numerous other atrocities, western epistemologies have suffocated other epistemologies. As discourses established during the Enlightenment became dominant throughout much of the world, objectivism, absolutism, and hierarchical and binary ways of thinking and being also became dominant (Capra, 1982). More subjective, relative, and respectful ideologies and epistemologies stood in stark contrast to the discourses institutionalized through colonization (Wildcat, 2009). As public educational institutions were created, they were consciously and unconsciously based on mechanistic thinking and colonial discourses.

Colonial discourses were often viewed and promoted as the only viable knowledge that existed, and public education unconsciously and consciously became a means to ensure their dominance. Boarding schools were a prime example of this phenomenon. Boarding schools for colonized peoples were designed to eradicate ways of thinking and being that contradicted what colonizers adhering to western discourses established to be the one right way to live and be (Foucault, 1972; Parks, 2023; Quinn, 1992). More ecocentric and respectful perspectives were targeted and erased by the leaders and participants of these institutions. In this way, United States' public education systems were based largely on epistemological assumptions and colonial

practices that paralleled the boarding school system. The foundation of public education in the United States was intertwined with practices designed to simultaneously protect discourses that perpetuated anthropocentric worldviews and attacked ecocentrism and interconnectivity (Parks, 2023).

There is a throughline connecting the dominant worldviews represented and presented in public education to the scientific thinking of the Enlightenment. As these hierarchical, binary, and absolutist ways of thinking being spread through European colonization, the false dichotomy that separates humanity and nature has become an unseen and unexamined aspect of the social studies and science education discourses (Kimmerer, 2013). Without critical examination, it becomes increasingly difficult to distinguish anthropocentrism and other foundational epistemologies from what is “true.” Trying to understand how universal “truths” are perpetuated in today’s social studies and science education discourses became central to the work of this thesis.

My interpretive lens was derived from a combination of Greene’s (1988) work on the effects of unnamed phenomena and Foucault’s (1972) ideas on the influence of discourse on what is perceived as truth. To imagine alternative possibilities that would allow for the conceptualization of ways to live in coexistence with the world, anthropocentrism needs to be named as a fundamental obstacle. However, since anthropocentrism has become institutionalized within western discourse, much as other institutionalized social structural problems have been institutionalized, as we name anthropocentrism and confront the discourse, we risk meeting resistance from the institutions with which the discourse has become intertwined. This creates a cyclical relationship between the naming of anthropocentrism in public education and in educational discourses. To challenge anthropocentrism, it must be named. To name it means

overcoming unconscious and conscious resistance to its naming among those who adhere to the discourse. However, it is extremely difficult to overcome such resistance without naming anthropocentrism. Therefore, anthropocentrism continues to go unnamed within the discourse, and it continues to be perpetuated in K-12 education. In this thesis, I explore examples of the cyclical relationship as it appears in social studies and science practice. However, it is important to keep in mind that this is an illustrative example of a much larger phenomenon that is at play across school subjects, academic disciplines, and modern society in general.

Chapter Three: Methods

I used a critical qualitative research methodology for this study, focusing on the subjective experiences of my participants, gaining insight from their perspectives, experiences, and meanings derived from their work in education. This study operated under the assumption that knowledge and meaning are relative and socially constructed. The idea that there are universal truths was challenged as I advocated for space to be opened for many different paradigms and worldviews. What I found was not *the* truth, but rather many truths that I hoped would inspire others to find what resonated within their own experiences.

Specific Type of Qualitative Research Method

The specific type of research method used in this study was critical qualitative research. The research was critical in that I sought to understand issues of power and domination regarding how current epistemological anthropocentric views influence the meaningful teaching of environmental education. Anthropocentrism can be problematic because it reinforces hierarchical thinking in general that leads not only to environmental destruction but also to many social and cultural inequities. It was my hope that the insights I gained could help others recognize the ways anthropocentrism and other problematic hierarchies create obstacles in our efforts to teach more critically about social and environmental concerns. I also hoped that all who read this work would recognize the ways dominant western views often work to separate people from the community of life, and the negative impact of this separation on all living things.

Research Setting and Participants

The study was conducted with participants from two universities and two public high schools all within the state of Oklahoma. Both universities were public institutions in suburban locations outside a major metropolitan area. The first university was Central University,² a midsized institution with a focus on math and sciences. The other university, Midwestern South, was much larger, with a greater emphasis on research. Both high schools were sizable suburban public schools in different school districts. One of the high schools, Collegetown High, was in the same town as Midwestern South University. The other high school was Western High.

I used snowball sampling to select my participants. I started with my advisor's recommendations for two outstanding teacher educators with reputations for teaching about the environment in meaningful ways. Each teacher educator then recommended a current in-service teacher who, they believed, taught about the environment in meaningful ways. As a result, there were four participants in the study. Each was interviewed in either March or April of the 2023 spring semester. The interviews were all conducted via Zoom, with participants calling in from their offices and classrooms. Additionally, one of the participants, Mrs. Rain, was observed in her classroom at Collegetown High.

The first participant, Dr. Williams, had been a social studies teacher at Western High before she became a teacher educator at Central University. While at Western High, she emphasized an awareness of social and environmental inequities in her history classes, particularly in her global education class. Beyond the classroom, she helped found and sponsored a student-led Gay Straight Alliance (GSA). After 18 years in the classroom, she went on to work at Central University, preparing pre-service teachers with a focus on their personal agency and

² Pseudonyms are used for all schools and participants.

power. Dr. Williams was critical of the underlying values inherent in the state standards, and she wanted future educators to be critical of them as well.

The second participant, Mrs. Ryan, was a science teacher at Collegetown High before leaving to pursue her doctoral degree in science education at Midwestern South. At Collegetown High, she taught environmental science, biology, geology, and meteorology. Mrs. Ryan also developed an aquaponics system, a native view science club, a garden club, and several meteorology projects during her time at Collegetown High. Outside the “formal” education setting, she worked in tribal science education and led environmental science workshops. Her love for both science education and the environment combined to make her a strong advocate for expanding environmental education in secondary education.

The third participant, Mrs. Rain, taught AP Environmental Science, AP Biology, and on-level biology at Collegetown High. She had taught many subjects beyond science in several states, including Oklahoma, Texas, California, and Missouri. She had also worked and lived in multiple national parks. In each place she had lived and worked, she emphasized connecting her students with the environment to ensure they understood their connections to nature. She was aware of the difficulties involved in teaching her students to consider the environment in their decision making, and she had experience teaching about controversial subjects.

Mrs. Thomas, the last participant, taught AP European History and AP World History at Western High. She had ample experience teaching AP classes and on-level classes. She also occasionally taught an ethnic studies class. Mrs. Thomas taught lessons designed both to cover the content and to improve her students’ writing, analysis, and critical thinking skills. Her focuses were geography and leadership. She admitted that including the environment in her teaching was a newer focus, but one she had not shied away from. Mrs. Thomas began

incorporating environmental history into her curriculum wherever she could. Within her teaching, she also promoted critical thinking and an awareness of the interconnectedness of the world.

Data Sources and Methods of Data Collection

Data was gathered through formal interviews, participant observation, and document analysis. I conducted semi-structured interviews with each participant. Although I possessed a list of questions, I wanted the interview to flow like a conversation, so deviation from the questions certainly occurred. One of my aims was to encourage my participants to name the obstacles that impeded meaningful environmental education in their classrooms. I also wanted them to identify the ways they coped with those obstacles. With these aims in mind, each of the interviews were roughly an hour in length. I interviewed Dr. Williams first, Mrs. Ryan second, Mrs. Rain third, and then interviewed Mrs. Thomas last.

In addition to the four interviews, I observed Mrs. Rain in her high school AP Environmental Science class. During my observation, I focused on how she discussed the environment, specifically looking to see whether and how she addressed the anthropocentric worldview. I also noted whether any of the obstacles she encountered appeared in our interview, and whether and how she sought to implement solutions to those obstacles. As a known observer who did not participate in the classroom (Merriam, 2009), I tried not to influence the lesson, but I was aware that my presence had an effect, and I kept this in mind while analyzing the data. Mrs. Rain was the only participant I interviewed because Dr. Williams and Mrs. Ryan were no longer teaching in the K-12 setting and because Mrs. Thomas did not have any lesson about the environment for me to observe that fit with our schedules.

During the lesson I observed in Mrs. Rain's class, the environmental science students interviewed Kathryn Savage about her book *Tarr Creek*. *Tarr Creek* is a book about mining waste that contaminated the land on the Quapaw people's reservation. Mrs. Rain had her students ask Kathryn Savage more about the effects of the contamination on the Quapaw people, as well as questions centering around interconnectivity and responsibility. This lesson was an exemplification of Mrs. Rain emphasizing her students' connections with the environment so they could understand their connections to nature and their communities.

Methods of Data Analysis

Traditional methods of document analysis were used (Merriam, 2009) to assess the Oklahoma State Department of Education Standards for Social Studies and Science. The interviews were transcribed with the assistance of the University Media Feature that transcribes recorded Zoom calls. I then went through the transcriptions to check for and clear up any discrepancies between the recordings and transcriptions. The field notes of the classroom observation included my personal notes and a transcribed audio recording of the lesson. The transcriptions and notes were individually coded, each data source coded before moving to the next, to utilize the method of constant comparison (Merriam, 2009). I desired for each set of data to naturally build on one another to find commonalities, so I utilized open coding on each data set before moving on to axial coding (Merriam, 2009).

I also conducted a document analysis of the Oklahoma State Department of Education Standards for Social Studies and Science, the (2013) NCSS standards, the practitioner book *Teaching Environmental Issues in Social Studies*, and three of Mrs. Thomas' lesson plans. In general, what I found in my analysis of the standards and the book for practitioners was a lack of

standards and resources for meaningful environmental education in both science and social studies education. While analyzing Mrs. Thomas' lesson plans, I looked for the obstacles my participants named during their interviews. The three lesson plans consisted of one lesson that centered around the environmental impact of World War 1, one lesson on urbanization where the students designed an industrializing city, and one lesson where the students explored documents about the Green Revolution. Through my analysis of her lesson plans, I looked for how and if the obstacles to teaching about the environment manifested. Ultimately, I aimed to make connections between Mrs. Thomas' lesson plans and interview responses.

During the open coding phase of my data sources, I recorded data that informed my research questions. After conducting open coding on Dr. Williams' interview, I utilized axial coding to identify common themes shared throughout the responses during the interview. Next, I interviewed Mrs. Ryan and conducted open and axial coding for her data, but now I was able to begin constant comparison and looked for what themes were appearing in both data sources. I repeated this process for both Mrs. Rain and Mrs. Thomas. Through this process the obstacles I discuss in chapter four emerged: lack of time, standards and testing culture, political and social pushback, and knowledge. Originally, I also wanted to determine how my participants were *overcoming* the obstacles they mentioned, but through this process it became evident that none of my participants knew how to. Because of this, I modified the second research question from past tense to present tense, changing it from "How did you cope with those obstacles?" to "How *are* you *coping* with the obstacles?"

After recording these obstacles shared by each of my participants, I noticed they seemed to build upon one another. After noticing this phenomenon, I took a step back from the data and asked myself if there was a theoretical explanation for what I was noticing. My conclusion was

the combination of ideas from Maxine Greene (1988) and Michel Foucault (1972) discussed in chapter two. This interpretive lens was used to inform the analysis of my data.

Means of Ensuring Confidence and Trustworthiness

I sought to promote rigor and ensure both trustworthiness and confidence through triangulation, member checking, and constant critical reflection of myself as a researcher. I triangulated the data collected from the interviews, observation, and document analysis. I had an open dialogue with my participants to ensure the data accurately represented them through member checking. Through constant critical reflection on myself as a researcher, I strived to acknowledge my positionality and bias. My positionality as a researcher and as one who cares deeply about the environment both consciously and unconsciously shaped and informed my interpretations of the data. The transferability of my findings came through my interpretation of the data.

Throughout this thesis, I utilized formal academic writing even though western academia, grounded in objectivist, absolutist, binary, and hierarchical epistemologies, often perpetuates the problem of assuming there are knowable, universal truths. I struggled to articulate my ideas and thoughts related to anthropocentrism, and that came through in the paper. However, I believe writing “academically” about something like anthropocentrism that is hidden in discourse is inherently difficult. I recognize the risk of perpetuating dichotomous thinking and objectivist assumptions in and through my writing, but I felt I needed to participate in that perpetuation to ensure that my audience could follow my argument. I want the ideas presented in my thesis to be a source of disequilibrium and to instigate critical reflection. The English language, like many dominant languages, is full of objective phrases. It is also a dichotomized language containing

constant hierarchical comparisons. However, it is the language I have been socialized to speak and understand, so I use it cautiously as a way to both identify and critique my findings.

As a researcher and person, I do not believe in objectivity and universal truths. I tried to practice disciplined subjectivity when conducting this research. What I mean by disciplined subjectivity is that I accepted the subjectivity in all data and analysis while still striving for rigor and evidence to accredit my subjective analysis (Merriam, 2009). Although my findings cannot be perfectly replicated, many of the insights are transferable. I desired to deconstruct the assumption of universal truths and open spaces for people to live in coexistence with the broader community of life. This coexistence may look different for each individual, and that is okay, because the diversity of life that results is necessary for the continuation and health of all life on the planet. I understand and acknowledge that these personal beliefs influenced my interpretation of the data, but I believe my study was stronger for it.

Positionality

Before moving on to the findings and analysis, I want to address my positionality. Throughout my life and education, I have become deeply critical of how the environment has been exploited and the ways this exploitation has been justified. I care deeply about environmental education, so I was critical of how the environment was taught by my participants. I was not immune to the theories expressed in my theoretical framework of how one's perception affects what one perceives and can critique. At the time of writing this, I had named anthropocentrism for myself and was constantly seeing its effects. What I found in my study was heavily influenced by my affinity for nonhuman nature, my personal political views about climate change, and how important I find anthropocentrism as a topic to discuss. The

views I bring as a person, teacher, and researcher are inseparable from this study's findings, analysis, and implications.

Chapter Four

Findings

The purpose of this study was to explore how the difficulty of naming anthropocentrism impacts teachers who wish to teach about the environment in meaningful ways. Toward this end, I asked the following questions of two social studies teachers and two science educators who strove to implement environmental education in their classrooms: (1) What were the obstacles you faced when trying to teach about the environment in meaningful ways? and (2) How did you cope with those obstacles? During my interviews, I realized my participants were still searching for solutions, so I changed the second question from past tense to present tense: How are you *coping* with those obstacles? The participants described encountering four kinds of obstacles. The first involved time, the second was the testing culture and standards, the third involved political and social pushback, and the fourth was related to knowledge. In this section, I will discuss each of these obstacles. The analysis of my findings will be unpacked in Chapter Four B.³

Time

The first obstacle identified was time. All four participants immediately identified “not having enough time” as a factor that prevented them from implementing meaningful environmental education. Lack of time was relevant to the other obstacles as well. It seemed to be the gut response, the response they gave again and again to similar questions about other topics. Not having enough time seemed to be a common problem, and every participant handled

³ It should be noted that each category is in constant interaction with the others. I have separated the categories for ease of reading, but they are all interconnected and should be considered as such.

it in their own particular way. Each participant had much to say about time, and they offered their own opinions and solutions about how to overcome these constant pressures.

For example, Dr. Williams said, as a teacher “you’re always making judgements about how much time I can spend or should spend on this (or that).” She described it as a balancing act of the calendar versus the content she wished to teach. An example she gave was a time she spent six days teaching about Gandhi and the Indian Independence Movement because her students did not know who he was. One student even asked, “was he the person who invented gold?” Dr. Williams was understandably distraught by the student’s question.

To address her students’ misconceptions, Dr. Williams decided to take the necessary time to make sure her students understood who Gandhi was and how the Indian Independence Movement shaped the subcontinent today. With this instructional decision, Dr. Williams deviated significantly from her original curricular plans. These lessons took six additional instructional days out of the semester of her global issues elective class. She made this judgment call because she believed it was important to educate her students about Gandhi, even though it created additional time pressures to get through her planned content. Dr. Williams noted that, as a teacher, she made those kinds of judgment calls every day, and in making such decisions, she could not always side in favor of what was best for herself and her students. She said that no one could do so without consequences. She said that this created a situation where one must constantly decide whether or not something is worth teaching. Similar challenges were also prevalent with my other participants.

Challenges related to time also existed for Mrs. Ryan, who had taught science for years in both formal and informal settings. Her formal settings included her public-school science classes, while her informal settings included after school programs and tribal education workshops. In

school she has taught environmental science, biology, and other science subjects. When asked about the obstacles she faced when teaching meaningful environmental education, Mrs. Ryan, Like Dr. Williams, immediately said “time.” She mentioned that she did not have time to effectively teach lessons that utilized experiments and activities. She explained that these took time to frame, to set up, to conduct the experiment or activity, and then to debrief with her students. She noted that within a typical class period, all of this had to be done in less than an hour. She said there was simply not enough time for experiments and activities to be done correctly, leaving students feeling rushed and struggling to grasp the point of what they were doing in the first place. Conversely, what she liked about teaching in informal settings was that she had ample time to properly do this kind of work with her students.

Mrs. Ryan also noted that time pressures overloaded students and teachers. She explained that she worked hard to develop special projects and opportunities such as a garden club and an aquaponics system to help her students reconnect with the natural world. These projects took a lot of time out of her own busy schedule, and her students also had to weigh various factors against participating in the opportunities, such as working afterschool jobs, spending social time, doing their homework, and engaging in extracurricular other activities.

Lack of time was also a factor for Mrs. Rain, the science teacher who replaced Mrs. Ryan at Collegetown High when Mrs. Rain took a graduate teaching assistantship position at a local university. Among other things, Mrs. Rain took over Mrs. Ryan’s AP Environmental Science and biology classes. Like Mrs. Ryan and Dr. Williams, Mrs. Rain also named a lack of time as the primary obstacle to implementing meaningful environmental education. She explained that she was “very behind” and that she and her students had been “playing catch-up” the whole

semester. She stated that she had been “pushing through” the content so the students would be where they needed for the AP test.

Mrs. Rain shared a surprising reason for why her class was so behind. For the first nine weeks of the year, Mrs. Rain was tasked with planning *and* grading “for a revolving door of substitutes” covering the biology classroom neighboring hers. This was her first semester at a new school, and she had to plan and grade for both her own class and the class next door. The situation not only limited her ability to prepare activities in her classroom, but it also meant there was no time for her to continue the additional projects Mrs. Ryan had started, including the garden club and other after-school activities. The way the year began, Mrs. Rain could not sponsor the garden club, even though she wished she could. Meaningful environmentally educative projects such as the garden club and aquaponic system became almost impossible with so little time.

I observed an excellent lesson in Mrs. Rain’s AP Environmental Science class. Even with the time constraints, the activity for the day was amazing to witness. Focusing on topics of environmental justice, Mrs. Rain’s students conducted a zoom interview of Kathryn Savage, the author of *Tarr Creek*. *Tarr Creek* is a book about health issues that arose amongst the Quapaw people of Ottawa County, Wisconsin. These health issues were due to the large amounts of lead, zinc, and manganese mining waste that contaminated their soil and groundwater. During the interview, Kathryn dove into the lives of those affected, presenting impactful and thought-provoking questions for the students to consider. The students engaged with feelings of guilt amongst victims of environmental hazards who blamed themselves for the harm that came to their children. The students also questioned why companies disregarded the people, and even pondered how pollution forces people to confront their interconnectedness with the world. All

these topics brought up by Mrs. Rain, Kathryn Savage, and the students promoted critical examination of issues related to the environment and environmental justice.

Although covering a vast expanse of content to prepare for the AP exam took considerable time, other factors also impacted Mrs. Rain's teaching. As she noted in our interview, her plans and activities always seemed to be pushed back and cut short.

During the class interview with Kathryn Savage, I observed firsthand how much time was taken up by things outside Mrs. Rain's control. The class started with Mrs. Rain rushing everyone to get ready for the Zoom call. She then called Kathryn, and the interview began. Morning announcements broadcast over the intercom interrupted the call, detracting from activity and taking an additional three minutes from the experience. Thirty minutes into the interview, Mrs. Rain had to end the call and start a new Zoom call because the high school did not have a Zoom subscription. This process took another two minutes. Next, Mrs. Rain had to end the interview early to play the daily five-minute video episode of the student-run morning announcements. Finally, the last minutes of class were spent reminding the students about upcoming projects and tests and allowing them to pack to leave. Between the morning announcements, ending and restarting the Zoom call, and the student announcement video, at least ten minutes were taken from Mrs. Rain's instructional time. This time could have been spent diving deeper into the meaningful conversations between the students and the author. This single example illustrates how many little things compete for teachers' instructional time, and one can easily imagine how they add up throughout the days, weeks, and school years.

My fourth participant, Mrs. Thomas, emphasized many of the same time-related obstacles associated with social studies teaching that were described by Dr. Williams. However, Mrs. Thomas offered a new insight that seemed relevant to all four participants. She stated that AP

courses forced her to have all content covered by roughly the third week of April. She stated, “I’m covering a minimum [of] 550 years of history and it’s just hard, it’s really hard to fit in anything outside the prescribed curriculum... I would say it really is the biggest [obstacle].” Mrs. Thomas asserted that geography is important in a history class, claiming that it is a key to discussing environmental issues in social studies classes. However, like Dr. Williams, Mrs. Thomas felt she had to make constant judgment calls when trying to find time to teach about geography in her history classes. Incorporating geography meant taking time away from the history content she needed to cover to prepare her students for their AP exams.

Mrs. Thomas also noted that lack of time prevented her from expanding the requisite knowledge she needed to do a good job teaching about environmental issues. This insight touched on the fact that Mrs. Thomas needed time to grow and expand not only her pedagogy but also her content knowledge. She said professional development, supported by the district and provided during work hours, often focused on new instructional strategies rather than giving her time and opportunity to expand her content knowledge. Mrs. Thomas said she would rather have professional development that helped her keep up to date with ever-evolving content. She specifically mentioned environmental issues as content she wished would appear in professional development because she did not have the time, support, or expertise to learn it on her own.

In sum, each participant had much to say about why time was a constant factor that they had to contend with when trying to teach about environmental issues. Dr. Williams noted the need to make constant judgment calls about what to teach and what to exclude based on the available time. Mrs. Ryan shared how constant time pressures limited her ability to lead after-school programs and activities, thereby diminishing their effectiveness and longevity. Mrs. Rain gave insight into how many little things ate away at her time when trying her hardest to teach

about the environment. And Mrs. Thomas stated that her professional development and growth were stunted by time pressures. She noted that even if she were able to find time to teach about the environment, she would not have the time to learn to do so meaningfully. All four participants stressed that time was the number one obstacle to teaching meaningfully about the environment, and lack of time is something all teachers face.

Testing Culture and the Standards

Although lack of time was a major obstacle to implementing meaningful environmental education, one of the main reasons *why* my participants had so little time involved the state standards and testing culture. Each participant's experiences varied in how the standards limited their time and ability to teach about environmental issues, but all four expressed that too much time was dedicated to teaching the standards and preparing students for various tests.

Dr. Williams, the former social studies educator and current teacher educator, focused heavily on the standards in her interview. She described key features of the social studies standards as obstacles to implementing meaningful environmental education. One of these features was that the standards were so comprehensive that they had the danger of becoming the curriculum. Another factor was that pressures to teach the standards were worsened by the high stakes testing culture that existed within the state. A third feature was that the content within the standards was subject to their creators. Dr. Williams stressed these points for her students, and in our interview, she did the same for me.

Dr. Williams pointed out that the standards were so comprehensive the entire curriculum could become consumed by them. Dr. Williams stated, "You have these standards used [as] your goal post. That's what you're supposed to get students to by the end of each semester, each year.

But that's not the curriculum." She explained that "the curriculum is everything else you bring into the classroom." She stated that it has become more difficult to include things other than what was in the standards as standards have been linked to tests, and test scores have been linked to success. Dr. Williams highlighted the danger of the standards becoming the curriculum.

A high stakes testing culture within the state reinforced the notion that the standards were the only thing that had to be taught. Dr. Williams explained that the tests were mandated, and as she faced continued pressures to produce high test scores, the standards became solidified as the curriculum. She mentioned that this was becoming more common for younger generations of preservice teachers who had gone through school within high stakes testing cultures. Dr. Williams said teaching her students not to privilege the standards and tests was like "untraining them." Dr. Williams wanted her students to determine the transferable knowledge present in each lesson and to know that a lesson should not solely focus on teaching a standard. She said it was challenging for her students to buy into these ideas because of their experience as past learners in high stakes testing culture, the increased pressures on teachers, and a general unwillingness to be critical of the standards themselves.

Dr. Williams helped her students become more critical of the standards by showing them that the standards were created by teachers. She wanted them to see that the standards reflected the interests of the select group of people who designed them. Understanding this, her students could see that the content was not objective and that biases could work their way into the standards. Dr. Williams also stated that state departments of education can change or omit proposed standards they do not like. She said state departments of education can reject standards written in "conceivably political ways," which causes the standards' authors to preemptively write them in ways to avoid political pushback. Dr. Williams stated that the standards are

subjected to biases and outside pressures and that this was one reason meaningful environmental education does not appear in the standards.

Dr. Williams shared how the standards were ever present in social studies education, but I was curious to see their effects in science education and how science educators taught about the environment. During our interview, Mrs. Ryan filled me in on how the standards affected her ability to talk about the environment in her general education science classes. Like the social studies standards, the state science standards also took time away from other meaningful activities, were used to promote a testing emphasis, and were lacking when it came to environmental education. Compared to the social studies standards, the state science standards had slightly more emphasis on the environment. However, according to Mrs. Ryan, they were still limiting and perpetuated testing pressures.

In her general education biology and chemistry classes, Mrs. Ryan had to take active steps to link meaningful activities and projects to the standards. She noted that teaching about the environment was more challenging in her tested, standards-driven classes than in her AP Environmental Science class. She spoke of the state science standards not supporting meaningful environmental education because they focused on learning the scientific processes without connecting how these processes existed in relation to the world. Mrs. Ryan also highlighted how the standards were largely objective. Although environmental science standards are included in the state science standards, we did not discuss these. Instead, Mrs. Ryan focused on the AP Environmental Science standards.

Mrs. Ryan stated that it was much easier to address the environment and incorporate meaningful environmental activities into her AP Environmental Science electives than her biology and chemistry classes because the AP standards supported this focus. With the

environment as the focus of the standards, her students were able to do meaningful activities and projects that her other classes would not allow. One of these projects had students create art where they could express their feelings about the environment. Mrs. Ryan showed me a piece of student art depicting a fish crying and sheltering her family with an umbrella from trash pollution. According to Mrs. Ryan, when teaching an environmental science class as an elective:

you [don't] really have to worry about the standards ... I would always use [them] to back up what I was doing, but it wasn't really an obstacle. But in the other classes, in biology, for instance, there are definitely things that you need to cover.

According to Mrs. Ryan, the environmental science elective allowed her to have more freedom than in her biology classes and other standards-driven classes. Throughout the interview, Mrs. Ryan detailed how the standards and state testing culture affected her while teaching at Collegetown High, and she explained the differences she felt between her standards-driven classes and her AP classes.

Mrs. Rain, the teacher who replaced Mrs. Ryan at Collegetown High, shared similar thoughts and experiences. When asked whether the testing culture and the standards affected her ability to teach about the environment in meaningful ways, she stated that the necessity to cover what was tested took time away from meaningful activities and projects. However, Mrs. Rain had a different view on the AP Environmental Science class, stating that it could sometimes limit meaningful environmental education.

Mrs. Rain explained that even though her AP Environmental Science elective escaped some of the pressures of standards-driven classes such as biology, the AP exam added testing pressure that limited meaningful environmental education. She spoke of being in a frustrating position where she felt she must take considerable class time to focus on preparing her students

for the AP exam instead of diving deeper into the environmental science concepts. Mrs. Rain had little time to spare since she felt the need to prepare her students for the AP exam. She spent considerable time on test preparation by lecturing about necessary content and giving timed writing exercises. By the time of our interview and my observation in the spring, Mrs. Rain said she was behind, and her class was “just pushing hard trying to get through.”

Mrs. Rain felt she could do more meaningful work with her students if she was in an environmental science class that did not have an AP exam at the end of the school year. She said that she would “really like to see an on-level Environmental Science here at the high school, but I know that that wouldn’t happen.” She said the reason an on-level course would not be offered was because of a perceived lack of interest in environmental science. There was only one section of AP Environmental Science, and it had just six students. Without the AP test being tied to the course, she believed it would not be offered. Since AP Environmental Science was an elective, it escaped the pressures of the standards-driven biology and other science classes. However, as an AP course, it was subjected to AP testing pressures.

My fourth participant, Mrs. Thomas, had the most experience teaching AP courses. Like Mrs. Rain, she expressed that AP testing pressures were an obstacle to implementing meaningful environmental education. She explained that the AP curriculum exacerbated time pressures she already felt as a teacher. Mrs. Thomas also walked through the challenges she faced when trying to balance skills and content for the AP history exams. Since the environment was not in the standards or a major focus of the AP history exams, it was difficult to discuss in her classes.

As noted earlier, Mrs. Thomas felt she must spend considerable time focusing on the AP curriculum. Most students take AP courses with the hope of doing well enough on the AP exams to receive college credit. Because of this reality, Mrs. Thomas believed that not properly

preparing the students for the AP exam was a disservice. As a result, she felt an obligation to focus on the AP curriculum and skills. This personal obligation led Mrs. Thomas to feel that her class was, to a large degree, dictated by the AP exam. Just as Dr. Williams had described the comprehensive standards basically *becoming* the curriculum, Mrs. Thomas said the AP curriculum essentially *became* the class curriculum, leaving little time for anything other than what was best for test preparation.

Another aspect of AP test preparation involves developing the skills necessary to take the test. Mrs. Thomas discussed the necessity of taking time to develop these skills. She stated, “The AP course is so skill driven,” and added that the students need to be “able to analyze documents and write essays and formulate thesis statements and provide proper context.” As a result, “there’s a lot of ... skills that I really have to hone in on.” Mrs. Thomas added that the students are all at different skill levels, and it varies from year to year, so the time needed for skill development also varies year to year. She also discussed the skills that must be developed for proper test preparation. With all these factors, her classes became balancing acts of teaching the AP curriculum *and* the necessary skills. This balancing act left little time for anything other than test preparation, so the testing pressures of AP courses were ever present in Mrs. Thomas’s classes.

As a member of the AP Board, Mrs. Thomas knew what content would be tested, and she knew the environment was not a focus. Content that would not appear on the AP test was difficult for Mrs. Thomas to justify focusing on when so much had to be covered before the exams in the spring. She spoke of the difficulties of including content that would “take time away” from what she believed was necessary for the exam.

Mrs. Thomas' AP classes were not dictated by the standards as much as were the on-level courses. Instead, they were dictated by the AP Board and its exams. Mrs. Thomas stated that since the environment was not featured in the narratives that comprised the AP exams, it was difficult to incorporate a focus on the environment into her courses. These concerns resonated with all four participants.

Each participant expressed that the standards and state testing culture were obstacles to implementing meaningful environmental education. Each anticipated and prepared for the reality that they had to adhere to the standards and end-of-year tests. However, the obstacles teachers face when trying to teach about systemic problems such as the environmental crisis do not end with the standards and the testing culture. There were deeper reasons which help explain why teachers feel compelled to accommodate and take so much time to ensure the standards are taught and that students are prepared for them. When asked *why* the standards and testing culture were such significant obstacles, beyond the time they took, each participant addressed the potential pushback teachers can face if they do not follow the standards or properly prepare students for the tests. The concern for political pushback strongly encouraged compliance.

Political and Social Pushback

Each participant detailed how the standards and testing culture were obstacles that made it harder to teach about the environment in meaningful ways. When asked why they felt the need to have lessons covering each standard and skill-based activities for the various tests, they each acknowledged that they feared potential political and social pushback if they strayed from these focuses. All four participants shared examples of pushback they received throughout their careers and discussed different ways they protected themselves.

Dr. Williams identified many ways she had experienced pushback when teaching. She shared that political opposition had become an ever-increasing challenge. She detailed how administrators are people who could intentionally and unintentionally be sources of pushback. Dr. Williams also said that complaints from parents and the students themselves had considerable weight behind them. With each group of stakeholders (e.g., administration, parents, students), she worried about exposing herself to pushback when and if she asked her students to consider political issues.

Dr. Williams explained that discussions around the environment were seen as a threat to various industries, such as automobiles, oil and natural gas. She said this led to the politically motivated erasure of attention to the environment from the social studies standards during the past 15 to 20 years. This erasure occurred because of the State Department of Education's ability to change or omit what they did not like from proposed standards. Dr. Williams said that important environmental issues were intentionally excluded, and that the standards were intentionally written to not receive so they could be passed and implemented. Dr. Williams noted that these exclusions made the standards inherently political, because they dictated what should and should not be taught. She said when she taught outside the social studies standards, she exposed herself to political pushback, because she was essentially teaching what was not supposed to be discussed. According to Dr. Williams, a common source of this political pushback was from school administrators.

Administrative pushback was a common fear Dr. Williams faced, and she told of a time when she experienced it firsthand. While teaching a social studies elective called International Studies, she had the students study resource extraction in Africa. Her students subsequently created campaign posters to bring awareness to various issues related to African resource

extraction. One poster asked, “Do you know what’s in your cell phone?” Dr. Williams said this poster explained the connections between cell phone mineral extraction, conflict, and sexual assault. Dr. Williams said her administrator “pulled them all off the walls and brought them into [my] classroom and said, ‘You can’t put these posters up.’ And I said, ‘Why not?’ And he said, ‘You know, it’s inflammatory or upsetting people.’” Dr. Williams ultimately had to tell her class that the posters were taken down, and she had a conversation with her students about “how sometimes people aren’t ready to hear” hard truths. Dr. Williams explained that the political nature of the project was what led her administrator to shut the project down. However, she also noted that she had done similar projects with her students that were not met with such a strong reaction.

Dr. Williams stated that she expected pushback from students and parents if her lessons encouraged her students to reflect on their ways of life. Out of concern for this pushback, she framed her environmental conversations carefully, because meaningful conversations about the environment often required students to examine their daily lives. She explained that when students were asked to examine their daily lives or the ways they thought, she could be accused of pushing an ideology or theory. She added that teachers are losing their autonomy in their classrooms, and that there is a constant threat of micromanagement by parents.

Consistent with Dr. Williams’ experiences in her social studies classes, Mrs. Ryan shared ways in which social and political pushback affected her efforts as a science teacher. She said meaningful environmental education projects often required administrative approval and support, and she added that student apathy was another source of resistance. Yet another obstacle, according to Mrs. Ryan, was parental political pushback, much of which came from parents who

were misinformed about science. These various forms of opposition made it difficult for Mrs. Ryan, as a science teacher, to go beyond the standards and test preparation.

Mrs. Ryan shared that although many of her projects provided opportunities for her students to engage with meaningful environmental topics, those projects were heavily dependent upon administrative support. While Dr. Williams demonstrated how administrators could push back directly, by shutting down an existing project, Mrs. Ryan noted that administrators could also push back less directly, by denying necessary funding and school space for projects they did not desire. Mrs. Ryan stated that it was very important to avoid an adversarial relationship with her administrators who controlled the resources she depended on, noting that they had the ability to significantly limit what she could do. However, Mrs. Ryan added that even though lack of administrative support could seem adversarial, it was important to have empathy for them because they were experiencing significant pushback as well.

Administrative resistance the not the only source of pushback encountered by Mrs. Ryan. She added that the students could also create obstacles by being apathetic, which often determined whether a project succeeded or failed. Mrs. Ryan explained the difficulty of motivating her apathetic students and trying to encourage them to see the transferability of environmental science. She said she felt most of her students "... hear all this noise (about climate change) ... [and] know something's up," and that they wanted to understand it and what they could do about it. However, she said that the projects had to be personally relevant, because without personal relevance, feelings of hopelessness about the future deterred their participation. She shared that to be personally relevant, the projects needed to be on-going and to sustain their interest, by being hands-on, interactive, and allowing students to spend time outdoors. However, she described reluctance from students to go outdoors, which made it difficult to implement the

projects which relied heavily on student interest. For Mrs. Ryan, student apathy, even if subconscious, was an example of student pushback.

Yet another source of resistance involved parental and student misconceptions about science. According to Mrs. Ryan, both student and parental disapproval of some of her lessons was based on misinformation. She discussed an activity in which she had her students make posters to show to their parents during parent teacher conferences. The posters focused specifically on misinformation in science, with examples of logical fallacies, conspiracy theories, and creationism. To protect herself from potential pushback, Mrs. Ryan made sure the topics selected were student driven. Mrs. Ryan said the students were proud of their work, but she recalled that some of the parents had looks of disapproval as they observed the posters. Consequently, Mrs. Ryan prepared herself for contentious conversations with parents or administrators. She was relieved that those conversations never occurred, and she expressed she felt fortunate that her district may have had more diversity of thought than was the cases in other districts.

Mrs. Ryan worried about pushback as an ever-present obstacle, even when it did not materialize, and Mrs. Rain shared similar sentiments. Describing a teaching experience prior to joining Collegetown High, Mrs. Rain discussed receiving complaints from students and parents about a lesson over the reintroduction of wolves into Yellowstone National Park. She noted that local industries disliked teachers presenting critiques of their practices. Additionally, like Dr. Williams, Mrs. Rain stated that she had to be mindful of not interjecting her views for fear of being accused of indoctrination.

With regard to challenging local views and practices, Mrs. Rain shared that she used to teach biology in a ranching community. She described receiving pushback from her students and

their families when she taught about the reintroduction of wolves in Yellowstone. Her lesson was about how wolves are essential to the Yellowstone ecosystem, and how their reintroduction helped the ecosystem return to its natural state. However, simultaneously, this reintroduction had a negative economic impact on ranching and ranching families because some of the wolves fed on the cattle. As part of this lesson, Mrs. Rain's students interviewed members of the community about the complex issues surrounding the negative impacts of farming on our ecosystems. According to Mrs. Rain, students who began with negative views of the wolf left with more balanced views and complex understandings. They better understood how the wolf could negatively affect the ranching industry while at the same time positively affecting the ecosystem. Nonetheless, because of this lesson, Mrs. Rain received complaints.

Mrs. Rain warned that local industries dislike teachers presenting critiques of their practices to students. Having lessons on these topics, she worried that her students would bring the information home and upset their parents who were part of the industries being critiqued. Her worries about upsetting the community also included her students, some of whom worked in the industries themselves, as was the case with her students in the ranching community. While continuing to encourage her students to think critically, Mrs. Rain noted that the lessons made her vulnerable to complaints by parents who did not want their children examining their daily lives as well as from students who felt personally attacked after their own critical reflections.

Mrs. Rain also emphasized the constant need to be aware of how her own views might show through in her lessons. She said she needed to be wary of pushing her own views when designing and teaching lessons that required her students to examine controversial social or political issues. Mrs. Rain approached controversial topics by presenting information to her students and encouraging them to come to their own conclusions. She stated that she wanted her

classes to have “opportunities to learn [and to] “construct their own knowledge.” She is mindful of having her students come to their own conclusions because of the constant potential of being accused of indoctrination. Since Mrs. Rain’s lessons went beyond the standards, she felt she had to be strategic in protecting herself.

Mrs. Rain wanted to empower her students and raise their awareness of the political issues related to the environment. However, to do so, she had to be mindful of the various forms of pushback that could occur. Mrs. Rain concluded that constructivist methods worked best in protecting herself from social and political pushback. Since many of her lessons transcended the standards and test preparation, she felt that she had to be strategic in protecting herself.

Finally, like the others, Mrs. Thomas also recognized the importance of strategically avoiding social and political pushback in her social studies classes. Mrs. Thomas observed that she sometimes avoided resistance when teaching about the environment because her students and parents failed to see this as threatening. She also noted that building a reputation that could withstand parental and student complaints helped her overcome and avoid some of the pushback. Although these strategies have worked for Mrs. Thomas, she admitted that it was becoming more difficult each year.

Compared to other political and social justice topics, Mrs. Thomas said that she was not worried about receiving complaints for having discussions about the environment in her classroom. Yet, she did note that she could face pushback because environmental history was not in the standards or tested on in the AP exam. Teaching AP classes, she felt obligated to properly prepare the students to take the tests at the end of the year. Although environmental history was not a major focus in the AP history exams, Mrs. Thomas justified including it to practice skills necessary for the AP exam. One example of this was Mrs. Thomas’ lesson on the Green

Revolution, where students analyzed information about environmental policies of the 1970s to practice writing document-based essays. This approach helped protect Mrs. Thomas from possible complaints on the basis that she was teaching writing skills to prepare her students for the AP exam.

Mrs. Thomas said she built her reputation on being a teacher who did not deal with unnecessary complaints. Part of this reputation came from her practice of connecting her lessons to the standards and skills. However, she acknowledged that her classroom management was another means by which she avoided pushback. Early in the semester, she established parameters that encouraged a supportive classroom environment in which diverse ideas could be openly and respectfully discussed. She said she fostered an environment that allowed for differences of opinions, in which students could encounter and express critical views without feeling like an ideology was being pushed on them. This minimized student opposition when they encountered ideas with which they disagreed. Mrs. Thomas thought fostering such an environment required experience, and she did not think “every first or second-year teacher is necessarily going to be able to do that.” She stated that it was something that came with years of experience and developing strong relationships with administrators.

Looking holistically across my participants, each experienced significant pushback, and each developed strategies to cope with the various forms of social, political, administrative, parental, and student opposition they encountered. Yet, even with these sophisticated strategies, the challenges they experienced made it significantly more difficult to implement meaningful environmental education. Moreover, as I analyzed the obstacles they described, it became clear that, yet another layer of complexity contributed to the challenges they faced. Each participant

also struggled with acquiring requisite knowledge to teach about the environment in meaningful ways.

Knowledge

Based on the data, lack of time, pressure to adhere to the standards and to prepare for the examinations, and considerable threats of social and political pushback all contributed to the challenges experienced by my participants as they sought to teaching about the environment in meaningful ways. They explained that neither the social studies standards nor the science standards supported an environmental focus, and that few of the tests addressed the environment either. As a result, they had to stray from the standards and test preparation to teach about the environment in meaningful, ecocentric ways. However, when this occurred, they encountered additional obstacles, including constant threats of pushback from various sources. In addition to all these obstacles, my participants named yet another significant challenge. In one way or another, each participant also identified the need for further interdisciplinary knowledge in order to teach meaningful environmental education. Among other things, they identified the need for knowledge and expertise, greater understanding of what environmental topics could be focused on in each subject, and a better understanding of what constituted meaningful environmental education.

As a social studies educator, Dr. Williams willingly admitted she had much to learn when it came to teaching about the environment. She identified three main aspects of social studies education that made it difficult for her to know how to teach about the environment. One factor was that the environment was treated as an afterthought in historical narratives. Another aspect was the lack of access to academic ideas as a classroom teacher. The last factor was a lack of

interdisciplinary science knowledge necessary for meaningful environmental education. Dr. Williams said these aspects made it difficult for her to incorporate the environment into her social studies curriculum.

Dr. Williams observed that environmental history is an afterthought in history education, stating that historical narratives typically disregard the environment. She noted that this resulted in the licensing of social studies teachers who did not need to know about the environment in order to complete their teacher education programs. Although Dr. Williams primarily taught social studies from a social justice lens, over the years she began to incorporate environmental history as part of this focus. She felt that she did a good job “not necessarily with environmental history but teaching US history... [from] as inclusive a narrative as possible.” While she did not teach explicitly about the environment, she did emphasize how the environment impacted people. An example of this was the previously discussed resource extraction in Africa project. As powerful as this lesson was, it focused almost exclusively on how human-created environmental conditions affected people rather than on the effects of these conditions on the entire environment, including nonhuman life and the nonliving world.

Dr. Williams stated that a lack of access to academic resources, such as scholarly journals, made it difficult to expand her knowledge. Although access to academic research would have supported her lessons and improved her understanding of environmental topics, such resources were provided neither by the district nor the state. To make matters worse, Dr. Williams recalled administrators and colleagues questioning the legitimacy of academia as unnecessary, overly political, and flawed. Adding to these difficulties, Dr. Williams also recalled that as a new teacher simply trying to survive, taking the extra steps to acquire and defend academic knowledge would have made her first years of teaching even harder.

Another level of difficulty involved the interdisciplinary nature of environmental education. Dr. Williams believed this interdisciplinary nature made it even more important to have access to academic journals and research. She said the environment was not a focus in her social studies teacher education, and once she left college, her access to scholarly research was limited. Despite the challenges to accessing this information, she felt it was important to acquire the scientific knowledge necessary for environmental education. Such scientific knowledge helped her understand the issues she was addressing and allowed her to properly integrate science and social studies. Dr. Williams stressed the importance of possessing both scientific and historical knowledge when teaching about the environment. She believed this was important as a social studies teacher because she feared students, parents, administrators, and even other teachers would view her as lacking the expertise and legitimacy needed to teach about the science of environmental issues.

As a social studies teacher, Dr. Williams described the difficulties of teaching about the scientific aspects of environmental issues. Conversely, as a science teacher, Mrs. Ryan described how the social aspects of the environment were difficult to address in science classes. One reason for this difficulty was that Mrs. Ryan was taught to “stick to the science,” which meant that the science of environmental issues should take precedence to the social studies aspects. A second, closely related, factor was the common disconnection that exists between scientific processes and social dimensions. A third reason for the difficulty of teaching about the environment in sciences classes involved the dominance of western perspectives in the history of science. According to Mrs. Ryan, these combined aspects made it very difficult to engage in meaningful environmental education in sciences classes.

Mrs. Ryan also stressed the importance of including the social aspects of environmental issues in her AP Environmental Science classes. Although she was able to do so in *this* particular class, it was much more difficult to accomplish in her on-level classes such as Biology or Physical Science. Mrs. Ryan tried to integrate geography, history, and sociology, when possible, but she struggled because such approaches had not been modeled in her science teacher education. Although activities and labs exist which explain and explore the scientific themes and processes, social contexts within which these themes and processes exist are typically omitted and left to the teachers to learn and address themselves. Mrs. Ryan said it was easy for science to become mystified when it is taught and learned in the absence of a social context.

Mrs. Ryan explained that the mystification of science has become a big problem. For environmental education to be meaningful, it must be interdisciplinary, for without a social lens “you're missing a big part of what you're actually teaching.” Yet the standards and tests focus on science in a vacuum. Mrs. Ryan explained that if she was not careful, she could teach the scientific processes without any connection to how they worked in the world, and students could perceive science as disconnected from reality. Mrs. Ryan emphasized the importance of constantly being mindful of this risk when designing her lessons.

Mrs. Ryan identified the western scientific perspective as a major reason for why science was dissociated with reality. She stated that western science is “very sterile and removed.” She said that science is “not very holistic... there's not that reflection of the scientist as a human with personal biases and prior experience...that led them to this moment in the lab.” Mrs. Ryan explained that since the science standards were derived from a western perception of science, it was important to take conscious steps to avoid reinforcing this view. However, since there is little support to deviate from this perspective, she felt she had to do so on her own.

Mrs. Rain shared similar concerns. Noting that environmental issues are extremely complex and difficult to narrow down, she insisted that they required an interdisciplinary approach based on systems thinking. However, she added that these are not traditional ways of viewing or teaching science. As a result, she described feeling insecure when utilizing a systems-thinking approach, because she was not trained to think or teach from this perspective. These were some of the ways in which knowledge was an obstacle for Mrs. Rain.

Mrs. Rain said that the complexity of environmental issues made it difficult to break them down and teach them in parts, to separate a scientific process from its real-world effects. Many environmental issues span multiple disciplines such as economics, biology, physical science, geography, and history. These issues also rarely have isolated solutions, for there are many aspects and perspectives that must be considered. This conflict was evident in her lesson on reintroduction of the wolves into Yellowstone National Park. She and her students had to navigate the various interest groups surrounding and affected by the reintroduction. Mrs. Rain asked her students to consider how reintroduction had positive impacts on the ecosystem's biodiversity but negative impacts on the economic gains of the ranching industry. Mrs. Rain shared that her students struggled with the complexities of this and other environmental issues, and that they were often taken aback by the implications of the lessons they learned.

Mrs. Rain claimed that understanding the complex environmental issues required a person to think systemically and holistically, adding that these ways of thinking were not traditionally supported in science education. Instead, scientific processes within the Western tradition are typically examined without the context of the systems within which they exist. She noted that asking her students to start thinking systemically and holistically was a challenge. Mrs. Rain stated that she was taught to teach science through lectures and labs that focused on

the processes, and that thinking holistically required her to consider other subjects. She said she felt insecure teaching subjects she was not trained to teach. She added that as a science teacher, there was always the default of teaching just the science. If she wanted to incorporate social studies and other disciplines, she had to do so herself. Mrs. Rain felt this was easier to do in AP Environmental Science, where she had greater freedom. However, in her other classes there was an unspoken expectation that science would be taught traditionally. She felt there was little support for her wish to teach through a systems-thinking lens in her standards driven classes.

Both Mrs. Ryan and Mrs. Rain discussed the difficulties of incorporating social aspects into science education, and Mrs. Thomas offered similar reasons for why it was hard to incorporate the scientific aspects of environmental education into the social studies. Mrs. Thomas explained that as a history teacher, she needed interdisciplinary knowledge. She also noted that environmental concerns were not woven into the dominant historical narratives she received in her teacher education. Making matters worse, there is a lack of available professional development and accessible materials that teachers could use to weave a focus on the environment into the narratives themselves. These combined factors made it exceedingly difficult to incorporate environmental history into her teaching.

Mrs. Thomas shared how she was innately expected to have interdisciplinary knowledge. As a history teacher, she taught many different disciplines, including teaching the history of those disciplines. The history of the environment, science, philosophy, language, economics, and more appeared throughout her curriculum. Mrs. Thomas said it was difficult to keep up with it all unless she had a personal interest, and it was even harder to be an expert in each subject. She explained that lacking expertise made her feel she had less authority, which is how she felt when talking about the environment.

Mrs. Thomas stated that a lack of accessible materials and professional development opportunities made it even more difficult to weave environmental factors into her historical narratives. She noted that once she left college, the lack of materials made it hard to build a rudimentary understanding of environmental topics. She felt if she was going to be exposed to new materials, it was going to have to be through professional development. Mrs. Thomas stated that the professional development she experienced was far too focused on pedagogy and rarely expanded her content knowledge. This left her with a lack of trust in her ability to teach the content. Mrs. Thomas wanted to learn more about environmental history to incorporate into her curriculum, but she felt a lack of direction and support in gaining the required understanding.

My participants all agreed that the interdisciplinary nature of environmental education and lack of knowledge about how to teach it were important obstacles. From my participants, a complex understanding of knowledge as an obstacle formed. They explained how the need for knowledge of multiple subjects limited how they could teach about the environment. They also stated that traditional ways of teaching their subjects were not conducive to teaching about the environment. Each had opinions on how best to approach it, but they had received little support and had to develop their approaches on their own.

Analysis

As I analyzed my data, I noticed all the obstacles to teaching meaningful environmental education were interconnected and seemed to be leading somewhere deeper. I found myself continually asking, “Why?” Why did each identified obstacle prevent meaningful environmental education? Every response to this question uncovered new layers to consider. These layers were inherently connected and constantly interacted with one another. This process started when I

asked what meaningful environmental education looked like for themselves and their students. From there, I proceeded to my interview question: *What were the obstacles you faced when trying to teach about the environment in meaningful ways?*

Although each of my participant's experiences were unique, there were trends in the data that followed a pattern. While phrased in different ways and mentioned at different points in the interview process, similar sequences developed which allowed me to connect their responses and identify a throughline. This throughline became clearer as I continued to focus on my participants' responses to the continual question, "Why?"

Each participant's initial response was that there was not enough time for meaningful teaching about the environment. When asked, "Why is there not enough time to teach about the environment?" there were again strong similarities. Each participant indicated that a heavy emphasis on testing and standards limited their available time. I again asked, "Why? Why does an emphasis on standards and the testing culture make it harder?" Here it became clear that neither the standards in science nor the social studies included substantial environmental education, that the detailed standards and high-stakes exams did not leave sufficient time to teach additional information, and that stepping outside the accepted standards risked incurring strong political and social pushback.

Again, I asked, "Why? Why is a focus on meaningful environmental education not included in the standards, why would this limit your teaching, and why would you receive pushback?" Here two further insights were gained. First, all four participants indicated that meaningful environmental education requires additional, specialized, interdisciplinary knowledge beyond what was detailed in the science and social studies standards and beyond what was provided in their teacher education programs. Second, they concurred that the

pushback came from various sources, including administrators, parents, students, and the community. Overall, it seemed to stem from reluctance to break with established traditions and practices (as when the students resisted going outdoors to learn), and from perceived threats to commonly held and locally accepted ways of living and thinking, especially when those alternatives seemed to threaten their economic livelihood (as with the lesson on reintroducing wolves back into Yellowstone National Park).

As I asked the series of questions, it became apparent that the responses progressively came less naturally and required greater reflection. “Lack of time” seemed to be a quick and instinctual response to my first question. When asked why “lack of time” was a factor, although state standards and test preparation were not immediately identified, they were stated fairly soon. As my participants identified state standards and test preparation as obstacles, they initially did so without explaining how they impeded environmental education. Initially hesitant to discuss why standards and test preparation posed challenges beyond their demands on time, they eventually spoke of the risks of receiving social and political pushback for teaching outside the standards and failing to properly prepare their students for the high-stakes exams.

As I dug deeper with each of my highly qualified participants, I waited and hoped to hear mention of the concept of anthropocentrism (or human-centrism, or something else along these lines) that would further explain the conditions they described. However, in each case, the concept of anthropocentrism went unnamed until I identified it. Dr. Williams and Mrs. Ryan immediately recognized the concept when named. Yet neither mentioned it on their own. Mrs. Rain and Mrs. Thomas did not appear to recognize the term. Yet, Mrs. Rain’s lessons on the reintroduction of wolves into Yellowstone provided the closest example of meaningful environmental education associated with a critique of human supremacy.

One obstacle was that meaningful environmental education was not present in the standards and was not a focus in the AP exams. My analysis of the Oklahoma Academic State Standards for social studies and science indicated that humans are clearly prioritized as the most important life form (Oklahoma State Department of Education, 2019; 2020). Although my participants were critical of the political motivations behind these standards, and although each taught outside the standards, none of them identified the prioritizing of humans as a limitation.

While I cannot be sure of what my participants did and did not know, there seemed to be mixed levels of familiarity – even among these highly qualified professional educators – with the concept and critique of anthropocentrism. These mixed levels of familiarity highlight the hidden nature of anthropocentrism and the difficulty of consciously designing an ecocentric curriculum. Although Dr. Williams recognized the concept of anthropocentrism and acknowledged that the environment was an afterthought in dominant historical narratives, she did not identify the anthropocentric worldview as a possible reason that the environment is an afterthought in historical narratives.

Dominant historical narratives typically begin with the agricultural revolution (at best), an event anthropocentrically associated with the dawn of civilization (Diamond, 2012; Houser, 2023; Quinn, 1992). These narratives minimize and exclude the stories of cultures existing before this time as well as people who did not, and still do not, adhere to this worldview (Deloria, 1995; Deloria & Wildcat, 2001). The agricultural revolution marks the known beginning of when small groups of people began to systematically cultivate the land, plants, and animals around them. Gradually expanding these practices over subsequent centuries as agricultural communities proliferated, utility became a form of exploitation, displacing practices

of coexistence that had existed that had existed since the dawn of humanity (Diamond, 2012; Deloria, 1995; Deloria & Wildcat, 2001; Quinn, 1992).

In time, dominant relations to the land and other nonhuman life were extended and applied to other humans, and the growing agricultural communities became the rulers of the world (Diamond, 2012; Quinn, 1992). Hierarchical worldviews evolving from these changing relationships of domination and exploitation between humans and the earth and between humans and humans have informed our dominant historical narratives as well, which tend to be blind to the fact that the nonhuman world has come to be seen as nothing more than means to an end, completely devoid of historical agency (Foltz, 2003; Nelson et al., 202; Nissiotis, et al., 2013). Since dominant social and historical narratives have their origins in the agricultural revolution (at best) and have been spread by people possessing an anthropocentric mindset, the environment has never been viewed within western narratives as worthy of equal consideration.

Today, most social studies curricula are developed and taught by educators who possess an anthropocentric mindset, and the anthropocentric assumptions embedded in the curricula remain unnamed (Greene 1988; Nelson et al., 2021). Mrs. Thomas was critical of her teacher education program on the basis that it excluded environmental history. However, she did not explain *why* environmental history was excluded, only that it led her to exclude environmental history in her own curriculum. When the term anthropocentrism was named, Mrs. Thomas stated that she had never encountered the concept before. Lacking familiarity with a basic cause underlying our environmental condition, she was not in a position to advocate or institute substantive changes in her own teaching or the teaching of others.

Because most of western society continues to hold an anthropocentric mindset, it is not surprising that most social studies education programs also unconsciously perpetuate

anthropocentric narratives that exclude critical examination of the assumption that humanity is located above and outside nonhuman nature (Nelson et al., 2021). This can occur even among highly qualified educators who are deeply concerned about the lack of meaningful environmental education in the social studies curriculum, as was the case with Dr. Williams and Mrs. Thomas. This illustrates the extreme difficulty of effectively critiquing and addressing a systemic problem whose underlying causes remain unrecognized.

Mrs. Ryan came closest to naming anthropocentrism as an underlying cause when she stated that traditional western perspectives in science adhered to principles of objectivity, separation, and categorization. However, she did not note how these epistemologies contributed to hierarchical thinking, a fundamental aspect of anthropocentrism and a foundation for all other systems of domination. The science taught in schools is often perceived as eliminating bias and subjectivity (Stroupe, 2022; Van Poeck, 2019). Attempts to analyze processes and relationships of the natural world into separate categories pay little attention to the interconnections that exist between all life forms (Capra, 1982; Capra & Luisi, 2014). Dating at least to Aristotle, who perceived rationality as the basis of human superiority (Andrew & Robottom, 2001; Nissiotis, et al., 2013), principles of objectivity and rationality embedded in western science continue to serve as the anthropocentric justification for human supremacy (Andrew & Robottom, 2001).

Mrs. Rain commented on the difficulties of teaching about environmental issues due to their complexity and the challenge of separating scientific relationships from their real-world effects. To address this challenge, she tried to break the issues down to teach in parts. However, environmental issues are extremely difficult to address in science classes because they require consideration of how scientific processes interact, relate, and are interconnected, which conflicts with western scientific notions of objectivity and categorization (Lee, 2021; Rautio et al., 2022).

As a result, environmental issues are isolated and taught in a vacuum to conform to the standards of western science. Again, these notions of objectivity, separation, and categorization contribute to anthropocentric hierarchical thinking which largely goes unnamed in science education.

Like the dominant historical narratives taught in social studies education, western scientific perspectives taught in science education are also developed by people with anthropocentric worldviews. None of my participants acknowledged anthropocentrism as an obstacle to teaching meaningfully about the environment. Naming the underlying reasons behind the obstacles is a crucial part of fully understanding and addressing systematic problems. Without naming anthropocentrism (or human-centrism, or human supremacy) as a fundamental part of the problem, social studies and science educators can unintentionally undermine meaningful environmental education.

Operating from western epistemological principles of analytic separation and reduction, the science teachers expressed concerns about their ability to teach the social aspects of our environmental problems, and the social studies teachers said that they did not know the scientific processes or environmental history necessary to teach about the environment. All believed they lacked some type of necessary knowledge that was separate from their own areas of expertise. Such assumptions of separation are perpetuated, in part, by an anthropocentric view of the world (Lee, 2021; Mahy & Wallace, 2022). While it would be useful for science educators to understand social processes and for social educators to understand scientific relationships, I was most struck by the fact that there was apparently so little working knowledge of the concept of anthropocentrism and its central function in perpetuating our ecological crisis. Again, it is exceedingly difficult to address, much less resolve, a systemic problem until its underlying causes have been identified and acknowledged.

One reason anthropocentrism remains unknown is that the underlying epistemologies of separation and hierarchy are ingrained in the discourse and continually utilized in everyday speech (Foucault, 1972). One way to combat this power is to expose the epistemologies within the discourses in which they have become ingrained (Houser, 2009, 2023; Kissling, 2019; Lee, 2021; Mahy & Wallace, 2022). However, this can meet with political resistance since people in positions of privilege and power often influence the discourse (Foucault, 1972). The unnamed epistemologies that influence the discourse must also be named for the discourse to change. However, to name long-standing “commonsense” epistemologies as problematic is to confront what is commonly presumed to be “known.” Challenging what is presumed to be known can threaten those who continue to benefit from the power embedded in the discourse. To question the truth of anthropocentrism is to question the legitimacy of the practices and ideas it upholds, including notions of ownership, dominant religious narratives, and exploitation of the natural nonhuman and human environment. To question these concepts is also to question foundational aspects of social studies and science education (Houser, 2009; Leitenberg, 1967; Mueller & Bentley, 2006; Rautio et al., 2022).

My participants consciously or unconsciously challenged at least central aspects of anthropocentrism contained within the social studies and science educational discourses. The first anthropocentric aspect was the concept of ownership, most notably the ownership of private property and land. Private ownership of property and land has been ingrained in our vocabulary as pillars upon which the United States was built. These principles were solidified in public consciousness by John Locke’s notions of natural rights and the Declaration of Independence (Grant, 2005), as well as ongoing colonization, the doctrines of Manifest Destiny and the

“American Dream,” and the practices of those in power to justify expansion, domination, war, and genocide (Grant, 2005; Frymer, 2017).

The idea that land can be owned as private property is inherently anthropocentric. Since land has come to be viewed as something ownable, the life on the land has also been viewed as ownable and expendable. Living beings depend on the land for life. Without living beings, the land would be barren. The trees, grasses, flowers, insects, and other plants and animals are often viewed as either property or vermin (Andrew & Robottom, 2001). Vermin are seen as intruders on land that was theirs long before it became human “property.” The concept of “ownership” establishes an implied hierarchy of owner over property, perpetuating the anthropocentric assumption that people can and should own the land and nonhuman life (Quinn, 1992). When we question anthropocentrism, we confront the legitimacy of ownership. Thinking eco-centrally, with equal respect for the environment and all living beings, challenges the ownership hierarchy.

Legitimizing the possibility and the right to “own” private property through continual usage in education discourses grants the idea power. This power is manifested in the pushback we as teachers may receive when we confront assumptions of ownership. An example of this occurred when Mrs. Rain faced pushback for teaching about the reintroduction of wolves into Yellowstone National Park. Her students were members of ranching families who owned private property used for cattle grazing. Wolves, like many predators, are seen by ranchers as vermin and pests that need to be eradicated due to the “risk” they pose to cattle, chickens, and other farm animals. The wolves are given unsympathetic names because they are seen as intruders on the ranchers’ privately owned land, and they are seen as destroying the ranchers’ private property (since the cattle are also perceived by the ranchers as their private property). Mrs. Rain faced pushback because she asked her students to question the ranchers’ perspectives and consider that

the wolves naturally belonged in the land taken by humans. In asking the students to consider the hierarchies inherent in the right to own property, the lesson challenged the discourse, resulting in anthropocentric resistance from the community stakeholders.

Dominant religious narratives were a second anthropocentric assumption embedded within the discourse challenged by meaningful environmental education. Anthropocentric facets of dominant religions perpetuate human supremacy (Quinn, 1996). In the United States, a common example of this can be seen in Judeo-Christian teachings that the world belongs to humanity. As seen in Genesis 1:28:

And God blessed them, and God said unto them, Be fruitful, and multiply, and replenish the earth, and subdue it: and have dominion over the fish of the sea, and over the fowl of the air, and over every living thing that moveth upon the earth. (*King James Bible*, 1769/2017)⁴

The belief that God gave humanity the earth and all life on it to “subdue” and to “have dominion over,” and the fact that this verse comes from the creation story located at the beginning of the Bible, places anthropocentrism at the heart of Judeo-Christian religious discourse (Leitenberg, 1967). These religious teachings to subdue nature were subsequently spread through colonial activity under the guise of a God-given right to dominate (Leitenberg, 1967; Maltby, 2013; Nissiotis, et al., 2013, Quinn, 1996). The impact of this proselytizing has been felt by all life on the planet, including subjugated humans.

To examine anthropocentrism means to question all dominant western narratives, including religious narratives (Quinn, 1996). Approaching the world from an ecocentric perspective conflicts with the view that God gave humanity dominion over all other life on Earth.

⁴ This bible verse appears in Genesis 1:28.

Many other religious traditions that have existed (and still exist) within North America and throughout the world are more ecocentric and earth-centric in nature, viewing humanity as existing within an interconnected system (Wildcat, 2009). These religions were systematically attacked and designated as superstitions or spirituality or given other descriptors that attacked or undermined their validity (Deloria, 1995). Many Christian doctrines have, in part, legitimized themselves by delegitimizing ecocentric religions, and these doctrines have been institutionalized into many aspects of the United States as a nation (Maltby, 2013, Nissiotis, et al., 2013; Perry et al., 2022).

Formal education in North America is no stranger to institutionalized Christianity. Indian Boarding Schools and Catholic missionaries were on the frontlines of establishing Christianity as the dominant religion in the United States (Parks, 2023). Judeo-Christian beliefs regarding the hierarchical relationships between humans and the earth, and Christian indoctrination conducted in boarding schools are among the dominant narratives and forces that have shaped public educational discourses. Since many Christian principles are embedded in public educational discourses, it is often taboo to challenge anthropocentric narratives such as the idea that God created the Earth for humans. Part of the problem with much Christian teaching, particularly the teaching of Christian Fundamentalism, is that it utilizes and reinforces absolutist, objectivist, binary, and hierarchical epistemologies (Maltby, 2013; Perry, et al. 2022).

When Mrs. Ryan encouraged her students to examine scientific misinformation, she inadvertently challenged a powerful discourse based on creationist premises. Since a common example of scientific “misinformation” is the conflict that exists between creationism and evolution, asking one’s students to identify scientific misinformation about evolution implies that those who believe in creationism are misinformed. Like many, Mrs. Ryan encountered the

almost un navigable space creationism holds within public educational discourse. One of her AP Environmental Science students created a poster addressing scientific misinformation related to evolution, which required a discussion of creationism. Mrs. Ryan feared this would lead to a confrontation with Christian parents, resulting in severe consequences. Although Mrs. Ryan acknowledged her fear of this pushback, she did not explicitly connect how her students' work challenged anthropocentrism embedded in the discourse. Once again, when the silence is broken and the epistemologies underlying faulty assumptions are questioned, pushback can be expected by those who have benefited most from the discourses.

A third anthropocentric assumption embedded in common educational discourses is related to the theme of economic exploitation for profit. The United States contributes to and benefits from a world economy that exploits life and land in pursuit of profit (Houser, 2023; Mueller & Bentley, 2006; Rautio et al., 2022; Zinn, 2003). With profit as a primary aim and justification for human and environmental exploitation, attention is focused on quick extraction with as little cost as possible. The negative consequences for humans and the environment are viewed as necessary evils if they are considered at all (Andrew & Robottom, 2001; Clarke & Knights, 2022). Again, anthropocentric epistemological assumptions of separation and hierarchy underly the prioritization of profit, the exploitation of human and nonhuman life, and the perception that "natural resources" and nonhuman life exist solely for human consumption.

The discourses in social studies and science education help perpetuate these anthropocentric epistemological assumptions. In dominant historical narratives, the environment is considered an afterthought, a means to an end. In historical narratives taught in schools, the environment is commonly presented as a resource nations and empires have at their disposal to grow and expand (Oklahoma State Department of Education, 2019). As a result, environmental

destruction is largely disregarded, and nonhuman nature has little historical agency (Foltz, 2003, Nelson et al., 2021). In western scientific perspectives taught in schools, life is categorized and separated, and the interconnectivity of the world is broken into parts (Oklahoma State Department of Education, 2020). Although perhaps not the intent, such categorization and separation allow humans to manipulate, dominate, and exploit their human and nonhuman surroundings. For example, the practices of mineral extraction, and the resulting human and environmental exploitation, are “justified” in the name of technological innovation (Clarke & Knights, 2022, Feinstein & Kirchgasser, 2014; Leitenberg, 1967; Nissiotis, et al., 2013). As educators participate in these anthropocentric economic narratives of progress, we consciously and unconsciously help perpetuate the continued subjugation and domination of life on earth.

Anthropocentrism remains an underlying force in science and social studies educational discourses. Private ownership of property, dominant religious narratives, and exploitative economic systems are all perpetuated by those of us who benefit from the fact that anthropocentrism remains hidden in our discourses. Without naming and critiquing the anthropocentric epistemologies and assumptions embedded within our discourses, our ability to overcome the obstacles to teaching about the environment will remain severely limited. My participants provided examples of resistance they faced due to these limitations. None of them named anthropocentrism as a cause of the resistance they experienced, but each example illustrates that anthropocentric epistemologies and assumptions were in danger of being exposed and examined. The resistance comes from those of us who fear exposing anthropocentrism will threaten our power. This power is derived, in part, from the fact that anthropocentrism, as a foundational epistemology, remains hidden within our science and social studies discourses.

I originally sought to find teachers' solutions to the obstacles they faced when implementing meaningful environmental education. However, I had to alter my research questions because, rather than solutions, most of the information my participants provided was related to the obstacles they encountered and how they coped with those obstacles. Without a critical understanding and naming of the anthropocentric context, each educator not only faced difficulties related to time, standards, and political pushback, but also a lack of requisite knowledge. Each participant realized that they lacked certain knowledge that was needed in order to teach about the environment in meaningful ways. However, none of them seemed to know how people derive our power from unexamined epistemologies embedded within the discourse of anthropocentrism.

The invisible nature of the anthropocentric discourse makes it exceedingly difficult for us, as citizens and teachers, to identify what we need to know in order to teach about the environment and other systematic issues in meaningful ways. We must first recognize anthropocentrism as a formidable obstacle to environmental health and stability before we can begin to envision and achieve better alternatives. Until then, meaningful environmental education will remain elusive, and social studies and science educators who desire to implement it will continue merely to cope with the obstacles rather than overcoming them.

Chapter Five: Implications

The purpose of this critical qualitative study was to explore how the difficulty of naming anthropocentrism, manifested in K-12 education, creates obstacles to teaching about the environment in meaningful ways. So far, I have examined the concept of anthropocentrism, explained why meaningful environmental education needs to name and critique this phenomenon, and argued that most K-12 education currently fails to do so. I have also explained that the interpretive lens used to examine the data combines Greene's (1988) focus on the importance of naming existing obstacles in order to imagine better alternatives, and Foucault's (1972) focus on the power of discourse in perpetuating existing structures.

As described in Chapter Four, four intersecting obstacles challenged my participants as they sought to implement meaningful environmental education in their classrooms. These obstacles included lack of time, state standards and testing pressures, political and social pushback, and a lack of sufficient knowledge. Notably, none of my participants specifically named anthropocentrism as an obstacle, even as I probed for deeper explanations.

My findings suggest that implementing meaningful environmental education is no easy feat. However, I am still hopeful it can be done and done well. Each participant provided valuable insights into how meaningful environmental education might be accomplished. Dr. Williams stressed the importance of understanding that the standards are *not* the curriculum. Mrs. Ryan discussed the impact of relevant, hands-on activities in which students engage with environmental processes. Mrs. Rain showed the importance of empowering her students to interact with their local communities and to understand their own connections with the environment. And Mrs. Thomas helped her students see the importance of geography in history and how people are shaped by the environments within which they live. Even without explicitly

identifying anthropocentrism as an obstacle, all four participants helped their students develop ecological awareness. Yet, I cannot help but wonder how much more impactful environmental education could be if we can find ways able to name anthropocentrism as an underlying cause.

I am convinced that naming anthropocentrism for oneself, as a highly problematic foundational epistemology, not only in social studies and science education but in society itself, is an important place to start. The hidden nature of the anthropocentric worldview protects it from explicit identification and criticism. However, much like other problematic systemic factors such as racism and patriarchy, when it is exposed, some of its power and the power derived from it begins to falter.

One place to begin is in teacher education. Naming anthropocentrism during the teacher education process in social studies education classes, science education classes, and other teacher preparation courses, and encouraging pre-service and practicing teachers to engage with and reflect on how it permeates education and society, could lay key groundwork for further meaningful environmental education. This should include naming how anthropocentrism is unconsciously perpetuated from earliest childhood and into the elementary years where children are socialized within an anthropocentric context to believe that humans exist above and beyond all other life forms (Foster et al., 2022; Herrmann et al. 2010).

It is also important for teacher educators to recognize and discuss how anthropocentric socialization continues throughout middle school and high school (Foster et al., 2022), immersing students into a way of being that they are explicitly and implicitly told is the one right way to live (Houser, 2023; Kissling, 2019; Quinn, 1992). Once we, as pre-service and practicing teachers, have named anthropocentrism for ourselves, we can begin to find ways to critique and complicate it through many different avenues within our lives and our teaching.

One of these avenues could be to explicitly name anthropocentrism as a problem within our classrooms. Within social studies classes, teachers could identify the concept and show the various ways it underlies dominant western thinking and exploitation throughout history. This could include showing its role in preserving dominant views related to private ownership of property (a hallmark of capitalism), dominant religious narratives (such as those found in the Old Testament, which is the basis for the three major monotheistic religions of Judaism, Christianity, and Islam), and exploitative economic systems (such as mercantilism and capitalism).

In addition to identifying and utilizing such opportunities within the social studies curriculum, there are also opportunities to explicitly name anthropocentrism as a problem in other areas of the curriculum. In science classes, for example, teachers could discuss the interconnectedness of the world on a molecular level and explicitly note how this contradicts mechanistic and reductionistic notions that everything can and should be isolated, separated, reductively analyzed, and hierarchically arranged rather than being considered in horizontal relationships to a myriad of other factors within the world (Capra, 1982).

Explicitly naming anthropocentrism as a problem may be the most direct avenue to critiquing and combating the phenomenon, but it is not the only way. In some situations, we as teachers would expose ourselves to considerable pushback and great risk if we explicitly named anthropocentrism in the classroom. The educational contexts and discourses in many areas of the United States do not currently tolerate, much less support, the explicit naming and critique of anthropocentrism and other foundational concepts underlying our problematic systemic conditions (Darren, 2020; Houser, 2023; Kissling, 2019; Mahy & Wallace, 2022).

This is a difficult situation for a teacher (or citizen), having named for themselves that anthropocentrism is an epistemological foundation underlying many problematic systematic

conditions, yet not being able to openly teach this fact without facing potential consequences. The task then becomes finding other avenues that still allow for the critique of anthropocentrism without needing to explicitly name the phenomenon in the classroom.

One avenue that could open space for challenging and complicating anthropocentrism is by revising the social studies and science standards. Looking specifically at the current Oklahoma State Department of Education's Standards for Social Studies (2019) and Science (2020), both sets of standards hinder meaningful environmental education, and both are leading causes of the perpetuation of anthropocentrism in public education. The standards often dictate what is taught in classrooms and, as Dr. Williams warned, they run the risk of becoming the curriculum. Simply adding more standards becomes problematic, however, because we as teachers are already overwhelmed by the number of topics we are required to cover. However, revising what is currently in place could increase support for educators as we implement environmental education into our curricula.

An example might be to revise the Industrial Revolution standard WH 3.3 from "Evaluate the economic and social impact of the Industrial Revolution," to "Evaluate the economic, social, and environmental impacts of the Industrial Revolution" (Oklahoma State Department of Education, 2019). The simple addition of the word "environmental" would go a long way toward opening space for teachers to incorporate meaningful environmental education into their curricula without having to resort to subversive teaching methods.

Another powerful way to challenge and complicate anthropocentrism, without explicitly naming it in the classroom, is by highlighting that the anthropocentric worldview is not the only worldview. There have been countless more ecocentric worldviews that have existed throughout history. Although many have been lost to conquests by people and empires built upon

anthropocentric views of the world (Quinn, 1992; 1997; Zinn, 2003), not all have been lost, and many still proudly exist (Deloria & Wildcat, 2001; Wildcat, 2009; Ho, 2022). Among many spiritual traditions, aspects of Buddhism, Taoism, and many Indigenous beliefs are highly ecocentric. Core tenets of Buddhism involve the interconnectivity of all living things and the harmony that should be striven for amongst all life (Ho, 2022). Many Taoists also celebrate this interconnectivity and hold that through spiritual humility people can live in peace and coexistence with the world (Tsu, 2011). Many Indigenous communities view people as a part of the world they live in, neither above nor below it, and see sacred, spiritual interconnections between all living beings (Deloria & Wildcat, 2001; Wildcat, 2009).

Because anthropocentrism has attained the status of commonsense, when it is pointed out, it is often dismissed as being a fundamental and inevitable attribute of humanity in general. However, the existence of countless alternative worldviews over the history of humanity provides abundant evidence that anthropocentrism has never been the only way of thinking and being. Many ecocentric worldviews continue to persist and even to thrive despite how powerful and pervasive the anthropocentric worldview has become in contemporary societies. Teaching about these alternative historical and continuing perspectives can help students see that anthropocentrism has always been just one worldview among many, refuting the claim that anthropocentrism is the only way of thinking and being. With the realization that alternative ways of life are possible, further study of ecocentric worldviews can provide valuable information and inspiration to recover and imagine better possibilities.

It is possible, in existing courses, to explore how varying worldviews position people differently to the larger environment. For example, this could be addressed in classes such as the western and eastern hemisphere geography courses mandated by the Oklahoma State Department

of Education for 6th and 7th grade social studies. In geography courses, teachers and students can learn about how different cultures and communities around the world view the environment. As an example, the Oklahoma State Academic Standards for 7th grade eastern hemisphere geography require students to “evaluate the impact of a region’s major religions” (Oklahoma State Department of Education, 2019, p. 29). This standard allows teachers to explicitly discuss religions and worldviews, including perspectives such as Taoism and Buddhism that tend to be more ecocentric and to promote healthier relationships between students and the nonhuman environment.

Teachers can also introduce ecocentric perspectives in world history classes which, by definition, transcend western perspectives and experiences. World history teachers in Oklahoma could do this with the support of World History standard 1.2, which encourages teachers and students to describe and examine the “lasting impact of the world’s major religions and philosophies including Judaism, Hinduism, Buddhism, Christianity, Islam, Confucianism, and Sikhism” (Oklahoma State Department of Education, 2019, p. 70). Showing the differences in the cultures and histories that have existed around the world can provide excellent opportunities to examine how ecocentric cultures have interacted with the environment throughout time. This would also demonstrate to students that dominant ways of thinking and being are not “inevitable.”

Although ecocentric worldviews can provide crucial information and much-needed inspiration, it is essential that these perspectives be accurately attributed to their rightful authors and owners rather than being appropriated and falsely promoted as one’s own. Outsiders must also avoid projecting their own mechanistic and hierarchal thinking onto these worldviews, analyzing them into their constituent parts and asserting that some are better or truer than others.

Forced conformity and subjugation to one worldview or another only perpetuates existing problems. Rather than appropriating or presuming to judge alternative worldviews, we must simply appreciate and allow other's perspectives and epistemologies to inspire us to imagine new alternatives as we seek to improve our *own* relationships with the non-human world.

Finally, as educators, we must ultimately turn it over to our students, encouraging them to imagine and enact newly informed alternatives and possibilities with future generations in mind (Bingaman, 2022). Today's students and citizens will deal with the ramifications of climate change their whole lives. Revealing the underlying causes of the problem and informing of alternative worldviews will give them a chance to secure their future and the future of all life on Earth.⁵

In addition to encouraging our students to develop informed alternatives, we must also provide opportunities for them to test those alternatives. However, to provide safe spaces for them to apply and test their new possibilities, we must be prepared to face the obstacles of lack of time, pressure to adhere to the standards and prepare for the tests, political and social pushback, and lack of knowledge. We will have to face these risks because our students cannot do so alone. Through perseverance, patience, and courage, we can help our students secure a future both for themselves and the nonhuman world.

The processes of identifying and addressing anthropocentrism as an invisible force underlying and perpetuating our environmental crisis can serve as an illustrative example of how to address systemic problems in general. Throughout history, factors such as racism, paternalism, classism, and heteronormativity have wreaked havoc on the world while remaining largely

⁵ I acknowledge the inherent anthropocentrism in claiming that the only reason to live in more sustainable ways is to save the future for humans. However, we must find a way to make human life synonymous with *all* life because the way dominant, anthropocentric societies (i.e., Takers) are living now are actively leading to the mass extinction of life and diversity.

“invisible” to many of their perpetrators. One of the reasons these conditions persist is that they remain unnamed and firmly ingrained in our social and educational discourses (Foucault, 1972; Greene, 1988). In order to move forward, we must name and critique these perpetuating factors, and support our students as they create and enact new possibilities.

Looking beyond anthropocentrism, it is evident that many of our systemic problems are grounded in western scientific notions of absolutism, objectivism, dualism, and hierarchical thinking, continually reinforced in our everyday language and actions (Capra, 1982). These foundational assumptions and epistemologies must also be explicitly named and deconstructed as we seek to expand and complicate our social studies and science education discourses.

One way to complicate our traditional educational discourses is to draw more heavily on the new sciences (such as quantum physics and living systems theories) (Capra, 1982; Capra & Luisi, 2014) and to familiarize ourselves with the postmodern, post-structural, and postcolonial critiques of modernist thought. Dominant educational discourses are still grounded in mechanistic assumptions formulated during the Enlightenment and codified during the Scientific Revolution. As educators, we must continue to update our thinking and discourses to more accurately reflect the reality of the world.

As educators, we must recognize that the epistemologies that reinforce our assumptions, privileges, and ways of living are themselves derived from problematic ways of thinking and being. Ultimately, we must recognize that our very understanding of everything around us is deeply and inseparably affected by that everything. Recognizing that our own perceptions and perspectives relate to the ways we exist within the world cannot be ignored, forgotten, or avoided. Thought and action cannot be separated.

Once we have identified and developed more holistic epistemologies that reconnect us with life, we must put these epistemologies into action in our living and teaching. As citizens of the world, we must learn not only to think but also to live in healthier, more intentional, and more respectful ways. As educators we must also encourage and support our students to do the same. This requires challenging ourselves and our students not only to think in new ways, but also to live in new ways.

It is not just changing the way we *think*, it is also changing the way we *are*.

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