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How Does Youth Participatory Eco-Justice Action Research (YPEAR) Affect the Development of Environmental Literacy in Urban High School Students?

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HOW DOES YOUTH PARTICIPATORY ECO-JUSTICE ACTION RESEARCH (YPEAR) AFFECT THE DEVELOPMENT OF ENVIRONMENTAL LITERACY IN URBAN HIGH SCHOOL STUDENTS?

by

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ABSTRACT
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Under the Supervision of Professor Barbara L. Bales, Ph.D.

The field of environmental education (EE) has the aim of producing an environmentally literate citizenry that is not only aware of environmental problems, but motivated to work towards their solution (Stapp, 1969). However, much of the U.S. EE curricular focus has been on understanding the biophysical environment with rural populations, with little discussion about the environmental problems created by the dominant Western cultural norms (Kenis, & Mathijs, 2012; Malone, 2006; Prakash,1995). This study suggests in order to truly develop environmentally literate citizens who will work to change the oppressive habits of our dominant culture, people must be willing to enter into discourse to understand and be empowered to work towards a solution. As the birthplace of critical pedagogical movements, urban educators have much to offer the field of EE as they have been working to empower marginalized populations in meaningful ways for decades (Anyon, 1980; Freire, 1970; Ladson-Billings, 1994; Ye, Valrelas & Guajardo, 2011). This research study drew from the critical pedagogical movement and examined how the notions of ecopedagogy, empowerment and transformation overlapped to develop environmentally literacy. Specifically, this qualitative exploratory case study provides

insight on the impact one urban high school's three-credit Youth Participatory Eco-justice Action Research (YPEAR) project had on the development of urban students' environmental literacy. A diverse mix of nineteen urban high school seniors shared their experiences with the YPEAR process through interviews and discussions. After reviewing the curriculum documents and the transcribed student mid-year interviews, alumni exit interviews and student and staff discussions, the data was coded into categories. Through critical reflection on the initial codes and larger blocks of texts, ten themes were discovered. These themes were then used as a foil from which to understand how the notions of ecopedagogy, empowerment and transformation became manifest in the school's curriculum, students' YPEAR project, and ultimately supported students' development of environmental literacy.

In loving memory of

Belva and Elroy

For the love, strength, inspiration, passion and genes.

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Introduction

Background of the Problem

During his State of the Union Address on January 28, 2014, President Barack Obama declared, "Climate change is a fact. And when our children's children look us in the eye and ask if we did all we could to leave them a safer, more stable world, with new sources of energy, I want us to be able to say yes, we did." Delivering on this commitment, President Obama launched a Climate Action Plan last June to decrease carbon pollution, prepare communities for the effects of climate change, and take a central role in international efforts to tackle this global challenge. Additionally, the President's Climate Data Initiative was launched on March 19, 2014 to empower America's communities to prepare for the effects of climate change.

> President Obama is committed to ensuring that communities across America have access to the information and tools they need to protect themselves from harm today and potential damage in the future. This means connecting regional and city planners, resource managers, farmers, hospitals, and businesses with data-driven tools to help them better understand, manage, and prepare for the real-world impacts associated with climate change. (The President's Climate Data Initiative, 2014).

These actions are justified by decades of research supporting the notion that the United States (US) is not only facing a national crisis, but a global one. According to the National Research Council (2013), Earth's climate is warming to a rate beyond what we have seen in the past millions of years. Indeed, a magnitude of data has been recently released by powerful national scientific organizations such as National Oceanic and Atmospheric Administration (NOAA), National Aeronautics and Space Administration (NASA), Environmental Protection Agency (EPA), the American Association for the Advancement of Science (AAAS), and the U.S. Geological Survey (USGS) supporting

the need to address the seriousness of climate change. Even the U.S. Department of Homeland Security and Department of Defense are working on plans to be prepared for the effects of climate change.

Vice President Al Gore initiated the first climate change hearing in congress in 1981. In 1992, he wrote a best-selling book on a variety of environmental issues titled *Earth in Balance*. Gore followed up his book with the award-winning *An Inconvenient Truth* (2006), a documentary that followed his campaign to educate the world about global warming. In 2007, the Intergovernmental Panel on Climate Change and former Vice President Al Gore shared the Nobel Peace Prize for their efforts to alert the world to the threat (Leiserowitz., Maibach, Roser-Renouf, Smith, & Dawson, 2013).

Several media outlets labeled Gore's (2006) information inaccurate, yet the American Association for the Advancement of Science (AAAS) shows more than 97% of climate scientists agree that human-caused climate change is happening (What We Know),

> As scientists, it is not our role to tell people what they should do or must believe about the rising threat of climate change. But we consider it to be our responsibility as professionals to ensure, to the best of our ability, that people understand what we know: human-caused climate change is happening, we face risks of abrupt, unpredictable and potentially irreversible changes, and responding now will lower the risk and cost of taking action (p. 1-2).

Likewise, professional educators have a responsibility to respond to this fact and prepare our students for the 21st Century. Beyond content knowledge, it is our responsibility to help students respond quickly to lower the risk and cost of taking action. This chapter lays the foundation for an action research case study focused on one school's implementation of ecopedagogical praxis as a means to prepare US high school

students for the action necessary to address the climate change crisis. Specifically, it will explore the ways in which a three-credit senior thesis YPEAR project affects the development of students' environmental literacy, defined through a critical lens later in this chapter.

Statement of the Problem

Although the collaborative experts from twenty-six states who created the Next Generation Science Standards (NGSS) include aspects of climate change, these learning benchmarks alone are not enough to create the change necessary. For example, NGSS Lead State's (2012) performance expectations for ESS3: Earth and Human Activity help students formulate an answer to the question: "How do Earth's surface processes and human activities affect each other?" Although this integration into the NGSS shines a spotlight on climate change, it is not sufficient to transform the curriculum itself. In other words, understanding how human activities and the Earth's surface processes affect each other is not enough to change the way students' feel about the relationship, nor does it provide them with opportunities to take action to change the relationship to address climate change.

In part, this is because high school sciences are still fragmented into three disciplinary cores: physical science, life science and earth and space science rather than holistic integration. Furthermore, the language is still consistent with humans dominating and oppressing the Earth. A case in point, standard HS-ESS3-2. It reads: Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.

Simply adding climate change to the list of standards to be met is not enough to produce the change necessary to decrease our global impact. If students in the US are to become a part of the solution, there must be true curricular reform. In order for this to occur, US students must first accept that the dominant US culture oppresses the Earth. Furthermore, while simply accepting this relationship would be uncomfortable, it would not necessarily be enough to change the dominant pattern between the US and Earth.

Here, Friere's (1970) critical pedagogy provides a framework for this discourse: "Discovering himself to be an oppressor may cause considerable anguish, but it does not necessarily lead to solidarity with the oppressed" (p. 49). To do this, educators must revisit their curricular approach to understand their educational ideologies and explore transformative alternatives that will help students find solidarity with our Earth. Then, providing opportunities for US high school students to take action to address climate change can be the driving force behind curriculum reform. This study seeks to collect and share information from one urban high school's attempt at such curricular reform.

Purpose of the Study and Research Question

The purpose of this study is to explore one urban public charter high school's attempt to develop environmental literacy in students through a three credit senior thesis YPEAR project. As research practitioner, I collaboratively designed curricular lenses, advisory themes and a framework for the YPEAR senior thesis project at Escuela Verde (EV).

EV's mission states the goals of graduating reflective high school students prepared to live happy, healthy, meaningful lives. They accomplish this in part by collaborating with the community to create a strong sense of place and skills to flourish without harm, providing staff who model our vision and embrace education as liberation

and engaging urban youth by adhering to an ecopedagogical praxis. Curriculum has been designed to address these goals, yet the school assessment is still based on traditional objectives so there is no information regarding the impact this curriculum has on the development of environmental literacy.

Grounded in ecopedagogical praxis, EV requires a 3-credit YPEAR project as a capstone project for graduation. With a curricular focus on education for sustainability and restorative justice, the school believes that in addition to content-related standards, it is also important to provide authentic experiences for our students to realize and embrace their humanness while working to create positive change in their communities. In an attempt to put theory into action, the purpose of this study is to explore the ways in which the YPEAR project affects environmental literacy in urban students. Specifically, this study seeks responses to the question how does YPEAR affect the development of environmental literacy in urban high school students?

Significance of the Study

This qualitative case study of EV's YPEAR project focuses on a school with a focus on activism to improve the environment, and ultimately students' lives and communities. Youth Participatory Action Research (YPAR) emerges in the literature, as a means to offer an approach to create collective change that addresses the relevant issues. Kenis and Mathijs (2012) state, "while the individual behavior change approach generally tends to conceive of the environmental issue in terms of the sum of individual decisions and choices, the collective social action approach stresses the role of social structures and systems in causing environmental problems (e.g. Courtenay-Hall and Rogers, 2002; Jensen, 2002; Clover, 2003; Chawla & Cushing, 2007)," (p. 47). This

study considers the school curriculum to be a social structure that can be used to address environmental problems by helping develop environmental literacy. It is helpful to start with a set of well-defined terms.

Definition of Terms

This study uses five key terms: Urban education, environmental education, Education for Sustainability (EfS), environmental literacy, and ecopedagogy. As such, it is important to define each.

Urban Education. As the context for this research study, it is necessary to define what is meant by urban. For the purposes of this study, "the principal features by which we define and focus our discussion of urban are density and diversity, and their consequences: anonymity and complexity" (Daley, Fisher, and Martin, 2000, p. 540). Furthermore, it is important to understand the complexities that urban learners face, as pointed out by Kappel and Daley (2004):

> For many urban learners, anonymity is the consequence of political, social, and economic barriers that prevent the development of sustained relationships and restrict access to urban power structures and resources. Complexity is inherent in the lives of urban learners and is manifested in the multiple stressors created by the environment of urban poverty, violence, illiteracy, and unemployment. (p. 86)

Although the complexities of urban learners listed above are present in the school in which the research takes place, there is also an asset to working with urban education in relation to the study. For example, the density and diversity of ethnicities and socio-economic levels provides opportunities for emotional and social growth that are typically not present in rural or suburban counterparts.

Environmental Education (EE). EE has spent the last fifty years motivated to produce an active citizenry to address environmental problems. Bill Stapp and a group of

colleagues in the School of Natural Resources at the University of Michigan developed a definition that was published in the first issue of the *Journal of Environmental Education (1969):*

> Environmental Education is aimed at producing a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, aware of how to help solve these problems and motivated to work toward their solution. (p. 30-31).

According to the Environmental Protection Agency (EPA), EE is a process that allows individuals to explore environmental issues, engage in problem solving, and take action to improve the environment. The five components of EE are: awareness, knowledge and understanding, attitudes, skills, and participation. Although often considered an elementary subject, EE provides great opportunities for high school students to weigh various sides of issues to develop their own problem-solving and decision-making skills.

Education for Sustainability (EfS) According to the Wisconsin Center for Environmental Education, EfS:

> Provides people with the knowledge, skills, dispositions, and opportunities to promote a healthy and livable world. It is a holistic and systems-based approach to teaching and learning that integrates social justice, economics, and environmental literacy. The ultimate outcome of EfS is to sustain both human and natural communities.

Defining Education for Sustainability (EfS) has been a topic of great debate and much controversy. Many argue that its emergence will dilute the field of environmental education (EE), and cause divergent curricular models as EE leaders scramble to figure out how to have the greatest impacts on students' relationships with the Earth (Bowers, 2006). Others view EfS as a glimmer of hope as climate change continues to occur at an alarming rate. With this in mind, in 2011 the Wisconsin Center for Environmental

Education (WCEE) set about defining EfS by including trends in the US and held 25 community stakeholder input sessions around the state (p. 5).

A curricular framework was developed and was recently published by contemporary EE leader Lieberman (2013) titled, *Creating Standards-Based Programs in Schools and Districts*. The Environment-based Education (EBE) model updates it's predecessor, Environment as an Integrated Context (EIC). This framework is designed to help teach about the environment through the Common Core and Next Generation Science Standards (NGSS) and establishes a model for how to integrate EfS into today's contemporary, traditional classroom.

However, both of these frameworks share a common flaw: each serves the population who created them, the dominant, White US culture. In this manner, they try to fit sustainability into our current cultural norms, rather than trying to shift the paradigm and center on sustainability. In fact, Lieberman (2013) attributes much of EBE's success working with teachers and administrators in schools throughout the US, because it teaches current content, "EBE is not intended to turn students into political activists" (p. 5); a statement that seems to suggest the idea that turning students into political activists is a bad idea.

Of course, this research is exploring if YPEAR fosters activism designed to change the status quo as demonstrated in student projects. In order to reach a sustainable community, we must shift our paradigm to work to become a 'planetary citizenship' (Antunes & Gadotti, 2005). In this same manner, educators working for sustainability must also be willing to enter into discourse and make education shift to sustainability, not vice versa. Although not popular in the US, leaders in the EfS field need to take a bold

stance to embrace education for liberation. The international EE community has already begun to do just that.

In their article, "Conventional and Emerging Learning Theories: Implications and Choices for Educational Researchers with a planetary consciousness," Dillon & Wals (2013) push the envelope by introducing what they refer to as "post-normal environmental education", which "takes advantage of new forms of learning that do not fit the classical categories of learning" for environmental education. Both transformative and trans-boundary, these contemporary developments move beyond the behaviorist and cognitivist debate and begin to address critical theory. Whereas they see the dominant view of learning with conventional EE research instrumental, where knowledge transfer is predetermined with relatively fixed outcomes, post-normal EE research focuses on emancipatory views of learning. In this case, there is a high degree of self-determination, space for transformation that is co-created with emergent outcomes. This philosophy pushes against both conventional scientific research, and the environment of high stakes standardized testing.

Applying these ideas to the WCEE definition of EfS offers two simple refinements. First, in order to work with the Earth to sustain communities, the terminology chosen must reflect a decolonizing rather than oppressive tone (Sandoval, 2000; Smith, 2012). For example, the WCEE definition states that 'EfS provides people with the knowledge, skills, dispositions, and opportunities to help people to promote a healthy and livable world.' This definition sets the power hierarchy with humans on top. This means that EfS knows what the knowledge, skills, dispositions, and opportunities are to promote a healthy and livable world, that it has the answers and is going to share

them. Of course, as climate change has taught us, humans *are* the problem. Before we can fix anything, we need to fix *our* thinking. EfS should promote a new paradigm, where we work to repair the harm done with the Earth. As the oppressors, we need to develop a critical consciousness to work *with* the Earth. In the end, it is the Earth that will save the humans, not the other way around (Bowers, 2006; Freire, 2005; Hovardas, 2013).

Second, the definition states the ultimate outcome of EfS is 'to sustain human and natural communities.' According to Merriam-Webster, to sustain means : to provide what is needed for (something or someone) to exist, continue, etc. If EfS promotes a healthy and livable world, then the ultimate outcome should include an emotional attachment, such as meaningful human and natural communities. From a transformative paradigm, the ultimate outcome of EfS would be to encourage humans to become a *part of* healthy natural communities, to live *with* the Earth instead of *on* it, and become a part of the planetary citizenship (Bell & Russell, 2000; McLaren, 2004; McNaughton, 2010). What is being proposed moves beyond wordsmithing. It is a different view of EfS, one through a critical lens that brings issues of justice, power and the environment collectively to the front of the conversation. Not to seek answers, but to engage in the discourse. In order to accomplish this, educators must adhere to an ecopedagogical praxis, and be willing to put theory into action.

As a research practitioner, this research study adheres to the true form of praxis and flows between theory and practice. It offers information for understanding how one democratic learning community is using YPEAR to address EfS changes at a small, urban charter school in Milwaukee. With no documented models of a US high school embracing an ecopedagogical praxis, this study provides the insight of one urban school's

as an example of praxis: taking up action based on educational research while consistently reflecting and changing.

Centering these refinements, this project adheres to a definition for EfS with a critical lens. For the purposes of this study, I examined the extent to which EV,

> Provided opportunities for individuals and groups to develop a critical human consciousness as oppressors of the Earth. As a tool for education as liberation, EfS should offer opportunities for collective learning communities to practice entering into discourse and working towards justice, peace, and planetary citizenship. The ultimate goal of EfS should be to transform our paradigm to one where humans are actively living *with* the Earth rather than *on* it.

Environmental literacy. Likewise, an atypical definition for environmental literacy will be used for this research. Traditionally, an environmentally literate person has been someone who can demonstrate knowledge and understands the relationships of environmental systems and the natural world. For example, the Partnership for 21st Century Skills first objective states that environmentally literate individuals should "Demonstrate knowledge and understanding of the environment and the circumstances and conditions affecting it, particularly as relates to air, climate, land, food, energy, water and ecosystems" (2009, p.3). This objective projects a huge undertaking and few curriculums focusing on environmental literacy move beyond this objective (Wals, 2007). Furthermore, although many objectives address developing one's capacity to take action for change, few curricular models include opportunities for students to take action related to issues they are interested in (Hungerford, 2010). This is an important distinction, particularly when one considers employing culturally relevant teaching practices (Ladson-Billings, 1994). From a critical perspective then, it is necessary to redefine what it means to be environmentally literate.

For the purpose of this study, an environmentally literate person is someone who: (a) acknowledges that our current cultural norms are not in concert with the natural world; (b) has developed a critical human consciousness; and (c) has identified themselves as an oppressor of the Earth. Using this definition, an environmentally literate person is primed to actively engage in working for a more just, peaceful, and sustainable planetary community in order to liberate and decolonize the Earth. This individual's work is grounded in collective discourse through dignified interactions from multiple perspectives, rather than competition. Taken together, the critical definitions of EfS and environmental literacy yield a theory of ecopedagogy.

Ecopedagogy. Ecopedagogy, as a form of critical theory, is grounded in normative concepts such as planetary (i.e. identifying as an earthling), biophilia (i.e. love of all life), and sustainability. Gadotti (2011), a colleague of Freire, states that ecopedagogy gives, "… a chance for education to renew its old systems, based on competitive principles and values. Introducing a culture of sustainability and peace into school communities is essential so that these communities can be more cooperative and less competitive," (p.22). Beyond traditional environmental education, ecopedagogy embraces aspects of critical pedagogy and constructivism, making it both relevant to urban populations and transformative for students seeking to make change. Simply put, Saxton (2011) defines ecopedagogy as:

> A discourse, a movement, and an approach to education that has emerged from leftist educators in Central and South America including Paulo Freire, Moacir Gadotti and Leonardo Boff that seeks to re-educate "planetary citizens" to care for, respect and take action for all life.

Grounded in Central and South America, his movement has only recently begun to gain traction in the US, and to date there has been no documented study

of attempts to put ecopedagogy into action in a US secondary school. The literature supporting this study and these terms are shared in the next chapters.

Chapter One

Review of Literature: Section I

Environmental Education (EE) and Education for Sustainability (EfS) in the 21st Century: Embracing the Change

One of the most influential American naturalists, John Muir (1911) wrote, "When we try to pick out anything by itself, we find it hitched to everything else in the Universe" (p.110). Yet, current trends in US education treat humans as a competitive manipulator of society, economies and the environment rather than a cooperative part of the world through a holistic approach to education. Our current Common Core and Next Generation Science Standards (NGSS) are treated as objective truths broken into specific subtopics that are often used as evidence to support the dominant paradigm. Just as everything in nature is connected, curriculum content needs to be taught as an integrated whole rather than separate subjects with an emphasis on collective inquiry and action in order to empower urban secondary students to become active citizens.

Environmental Education (EE) provides a platform to tie these subjects together in a way that is meaningful and relevant to students. According to the Environmental Protection Agency (EPA), EE is a process that allows individuals to explore environmental issues, engage in problem solving, and take action to improve the environment. The five components of EE are: awareness, knowledge and understanding, attitudes, skills, and participation. Although often considered an elementary subject, EE provides great opportunities for high school students to weigh various sides of issues to develop their own problem-solving and decision-making skills.

Although EE is one way to make learning more relevant to high school students, it is often taught from the dominant, affluent paradigm. The need to shift the focus of EE to urban populations has been addressed as a top concern from the North American Association for Environmental Education, yet there have been few case studies of effective approaches to making EE relevant to marginalized urban youth. One field making progress is that of eco-justice education, which addresses the destruction of not only the world's biosphere, but also languages and cultures as a direct impact of the ethnocentric views of Western culture (Bullard, 1993; Eichler, 1977; Martusewicz, Edmundson, & Lupinacci, 2011). However, much of this eco-justice educational reform in the US is being done either at the university level or at sites outside of the secondary schools (Agyeman, 2005).

In juxtaposition, a contemporary shift in the field of EE towards Education for Sustainability (EfS) has become more prevalent in US secondary schools (Blewitt, 2004; Orr, 2002). Although researchers like Lieberman (2013) claim EfS is just another version of EE, it has made great strides into bringing sustainability into the whole school rather than as a subject area. For example, the EfS movement moves beyond the core curriculum to stress the importance of the school building itself. Additionally, EfS has more of an explicit connection with social justice issues than EE, making it a better fit for marginalized populations (Cloud, 2013). Overall, EfS provides a platform that does not claim to be unbiased, but rather attempts to address a problem while adding a social aspect to EE.

This concept of a more humanistic approach to EE and curriculum in general is rooted in the philosophy of one of the most celebrated critical educators, Paulo Freire.

Freire (1970/2005) stated, “Because it is a distortion of being more fully human, sooner or later being less human leads the oppressed to struggle against those who made them so. In order for this struggle to have meaning, the oppressed must not, in seeking to regain their humanity (which is a way to create it), become in turn oppressors of the oppressors, but rather restorers of the humanity of both,” (p. 26). He further states that “conscientizacao,” or critical consciousness, needs to apply to both the oppressors and the oppressed to take action, and that this onus is on the privileged to unlearn their oppressive ways of knowing in order to sustain change.

In order to embrace this type of change, we must model it in our classroom by developing respectful learning communities (Schultz, 2008; Stovall, 2004). Santos (2008) adds,

> "In addition, some of those curricula proposed take into consideration the aim of science education to prepare students for social responsibility, responsible sociopolitical action; they also reinforce the purpose of developing attitudes and values to help students engage in social issues (e.g., Cross & Price, 1992, 1999; Frazer & Kornhauser, 1986; Ramsey, 1993; Roth & Lee, 2004; Waks, 1992)," (p. 362).

Indeed, one of the general agreements among the scholars regarding the evolution of EE as a field and science education is that neither have been effective at reaching marginalized, urban populations. Furthermore, the US needs help to gain scientific literacy, and there is an even wider gap related to marginalized populations (Barton, Ermer, Burkett & Osborne, 2003; Hsu, 2009). Finally, it is generally agreed that EE and science need to be taught differently in order to reach these populations. However, there are some disagreements as to how to approach these issues (Dillon & Wals, 2006; Marcinkowski, Shin, Noh, Negev, Sagy, Garb, McBeth, Hungerford, Volk, Meyers & Erdogan, 2011).

Additionally, whereas EE research was dominated by quantitative, objective scientific research during its formative years, the past twenty years have shown a shift in EE research, stirred in part by the groundbreaking debate of Mrazek (1993) and Robbottom & Hart (1993). Although not opposed to quantitative research, Hart's (2000) underlying beliefs were that researchers should 'appreciate the independent and interrelated roles of ontology, epistemology and methodology in rendering more transparent these issues' (Hart, p. 38). For critical environmental educators living in the US, there are few research models to exemplify this critical shift.

One way to accomplish this is by shifting to an ecopedagogical praxis for teaching and learning in a school structure. Although founded in decades of philosophical beliefs, the ecopedagogy movement has had little research in North America. Essentially a contemporary critical theory that includes the Earth on the list of oppressed populations, many feel this belief goes against the capitalistic drive of the American culture. Although Khan's (2010) book offers some foundational northern contributions to ecopedagogy as a movement, focusing on drawing connections to schools, scholars, communities, and the planetary crisis we are currently facing, there has not been single, documented study done on a middle or high school that embraces ecopedagogy in the United States to date.

Philosophical and Theoretical Foundations of Ecopedagogy

Of the main paradigms of contemporary qualitative research outlined by Lincoln and Guba (1985), this research is grounded in critical paradigms. However, there is also a component of a participatory paradigm that is commensurable on certain issues, such as intended outcomes, terminology, and trustworthiness. The curriculum paradigm at the site has ideologies that are both constructivist and social reconstructivist, with a staff who

adhere to an ecopedagogical praxis for teaching and learning. This transformative philosophy believes that participation between researcher and communities being studied often results in a subjective-objective reality (Creswell, 2013).

This research is grounded in a worldview that embraces the notion that there are multiple realities and/or truths. Through exploratory case study design, the theoretical framework used by this project will be Freire's ecopedagogy. Applying an ecopedagogical praxis, teachers as well as learners examine systematically their own oppressor-oppressed roles as members of a particular unsustainable modern community/culture.

In order to truly address the issues of climate change, the US must first accept that their culture oppresses the Earth. Furthermore, simply accepting this would be uncomfortable, but would not necessarily be enough to begin to support the oppressed Earth. Freire (1970) explains, "Discovering [oneself] to be an oppressor may cause considerable anguish, but it does not necessarily lead to solidarity with the oppressed" (p. 49). One of Friere's (1970) last great contributions provides a framework for this discourse, as he added the Earth to his list of oppressed populations. In doing so, he suggested educators dedicated to liberation shift to an ecopedagogical praxis. Although ecopedagogy is gaining in popularity as a philosophy on a global level, we know little about if and how it contributes to secondary student's environmental literacy when put into action.

In his conversation with Myles Horton (1990), Freire explains that while it is important to have a better understanding of the theory behind education as a researcher, he also knows that, "*without practice there's no knowledge*; at least it's difficult to know

without practice" (p. 98). To truly embrace praxis, educators must move between research and action, and thus the major case for support for using Participatory Action Research (PAR) in a case study at a school using Youth Participatory Action Research (YPAR) as curricular reform.

Embracing a critical perspective, the worldview of this research is that reality is "out there;" it is material, yet interpretations of it can be controlled by human power relations. Creswell (2013) explains that this philosophical belief claims that, "Knowledge is not neutral and it reflects the power and social relationships within society, and thus the purpose of knowledge construction is to aid people to improve society," (p. 25). The philosophical and theoretical influences of ecopedagogy include a confluence of constructivism, social constructivism and critical theory, with a heavy influence of the critical ecocentric viewpoints from the field of environmental ethics (Hovardas, 2013; O'Donoghue & McNaught, 1991; Khan, 2008, 2009, 2010; Lotz-Sisitka, Fein, & Ketlhoilwe, 2013).

The great debate at the turn of the century juxtaposed Thorndike's (1906) positivist learning theory against Dewey's (1904/1965) constructivist theory. Although Thorndike's (1906), view that transfer of knowledge always be specific and measurable has had a significant impact on contemporary educational outcomes-based learning models, it is important to acknowledge that the current knowledge that is being transmitted has lead to the planetary crisis. One of the reasons ecopedagogy has not gained traction in the educational field is the stark contrast of these philosophical beliefs (Khan, 2010). The ecopedagogical perspective, on the other hand, embraces Dewey's (1904/1965) more holistic epistemological stance.

The theoretical foundation of constructivism (Joyce, Weil & Calhoun, 2009) states that learning is the construction of knowledge-it draws in, stores information, organizes, and revises previous conceptions. However, ecopedagogy draws on social constructivism as well, which believes learning is more than just assimilation of new knowledge; it is the process by which learners are integrated into a community of learners. There is a social nature to learning content itself, but also a place where cultural norms created. (McLaren, 2004; McNaughton, 2010; O'Donoghue, & McNaught, 1991).

Environmental Ethics, Ecocentrism and Ecopedagogy

Hovardas (2013) challenges our current cultural norms and posits three frameworks to consider subject-object dichotomy and the environmental crisis: anthropocentrism, ecocentrism and critical reconstruction of ecocentric accounts. The instrumental approach followed by western societies currently falls under anthropocentrism, where natural resources are used by humans to satisfy human needs. In this case, society is seen as the subject and nature is allocated the object role. Environmental ethics promoted the ecocentric approach, which granted intrinsic value to nature. In this case, both society and nature are acknowledged as subjects.

In the critical reconstruction of ecocentric accounts, in order to survive, society is obliged to follow natural laws. In this approach, society is now seen as the object, whereas nature remains the subject. Although Hovardas' (2013) suggestion to switch the subject-object paradigm of society and nature seems extreme to most, some researchers advocate this view as a necessity.

In support of this notion, Bowers (2006) takes this idea a step further and argues that we need to move beyond Freire if we want to truly embrace the value of the

commons. Considered a contemporary critical educator, Bowers argues we must look at humans as a part of the environment, instead of as the focal point. He asserts that the consumer-dependent lifestyle is at the root of all the environmental issues, and focusing on individual learners takes away from caring for the commons. However, just as environmental educators have developed frameworks for local, national and global environmental issues, eco-justice educators have begun to integrate local, national and global critical social issues as well (Gough, 1999; Greenwood, 2008; Grigorov & Fleuri, 2012 Gruenewald, 2004, 2008).

Pauw (2012) added to the research on different approaches to urban education, and concluded that when designing and evaluating EE initiatives, they need to be "…rooted in the specific local situation -- both physically and attitudinally," (p.1). He found that replicating effective approaches in one community would not necessarily be effective in others. This belief of personalized, culturally relevant education comes from a long line of constructivist researchers who would be appalled by the 'standardization as proof' antics of contemporary policy makers (Chomsky, 2000; Dewey, 1959; Giroux, 2001; Illich, 1983).

While the US remains stuck in the dominant nationalistic paradigm, the international community has already began to address global issues. At the forefront, Brazilian colleagues of Freire, Antunes and Gadotti (2005) recommended that ecopedagogy be adopted as the appropriate pedagogy for the Earth Charter. In a collaborative effort, they view EE and sustainability pedagogies as a premise for ecopedagogy. However, they view these classic pedagogies as anthropocentric, whereas, "Eco-pedagogy is based upon a planetary understanding of gender, species, kingdoms,

formal, informal, and non-formal education" (p. 136). They view ecopedagogy as a comprehensive point of view with the goal to society to evolve into a 'planetary civilization' (Bell, & Russell, 2000).

Grounded in Friere's (2005) critical theory, the overall goal of ecopedagogy is to change the dominant anthropocentric status quo through social reconstruction to value the Earth. Accomplished through a variety of practices including service learning, restorative justice and Youth Participatory Action Research (Barton, Ermer, Burkett, & Osborne, 2003; Cipolle, 2010; Duschl, 2008; Dyment & Reid, 2005, Wise & Fine, 2004), embracing ecopedagogy offers many implications to the field of curriculum and instruction as supported by Friere's beliefs.

Motivations for Curricular Reform.

Since the launch of Sputnik in 1957, the fear of the Cold War and need for national defense called for an increased structure within U.S. schools. The passage of the *National Defense Education Act* in 1958 by Congress increased funding to the National Science Foundation (NSF) to create more rigorous academic standards. This began the "push by NSF to expand its secondary curricula projects beyond the field of physics," treating physical science and engineering as the most important aspects of science (Ladson-Billings, & Brown, 2008, p. 159).

The publication of *A Nation at Risk* in 1983 offered legislation "to promote educational 'excellence,' and the target was lazy students and incompetent teachers, "for which the remedy was . . . more days and hours of schooling, more academic courses, more attention to 'basics,' more discriminating standards for evaluating and compensating

teachers, more standardized testing of pupil achievement, more elaborate reporting of test results by the local districts to state officials (Tyack and Cuban, 1995, pp. 78-79).

Yet, after two decades the US was still falling behind. In 2001, congress passed the *Elementary and Secondary Education Reauthorization Act*, better known as No Child Left Behind (NCLB). Reevaluating the data using the same scientific approach, much time, energy and money was invested in creating new national common core standards, updated standardized testing and extensive adequate annual yearly progress (AYP) tracking. The ultimate goal was set so that all students would be proficient in grade-level math and reading by 2014, however it is apparent, now that we have reached and surpassed 2014, that all students are not proficient at grade-level for math and reading. As new proposals for the next round of educational reforms are being debated, many of them are, again, focusing on more rigorous, national standards with the Common Core and Next Generation Science Standards (NGSS), and a new round of testing consortiums with the Smarter Balanced tests. However, with another round of more intensive standards and testing in the works, many educators, parents and students are starting to push back (Schultz, 2008; Prakash, 2010; Pratt-Adams, Maguire, & Burn, 2010; Buck Institute for Education, 2013; Davis, 2013).

Shifting curricular ideologies. This push back stems from one root question: why is education important? Although to most educators curriculum refers to what is taught, coming to a common understanding of what curriculum is has become a longstanding part of the debate. Null (2008) acknowledges that meanings of curriculum have shifted during the past 90 years, however he contends that, "…the idea that

curriculum development implies the preparation and transmission of knowledge within an institution whose purpose is to educate has remained consistent" (p. 478).

When considering this definition, the ideological question one must ask is, Educate for what purpose? Schiro (2008) defines curriculum ideologies as the curriculum visions, philosophies, doctrines, opinions, conceptual frameworks and belief systems of educators. He differentiates between four distinct ideologies: scholar academic, social efficiency, learner centered and social reconstruction.

The current exemplar for the contemporary US curriculum is the scholar academic ideology, where the purpose of education is to help children learn the accumulated knowledge of the culture (Schiro, 2008). Similar to a scientific food pyramid, there is a defined hierarchy with scholars at the top as inquirers of truth and students at the bottom waiting for teachers to disseminate the truth. The purpose of education is to give the knowledge so that students can climb the hierarchy to one day become a scholar to create truth to disseminate to future students (Schiro, 2008).

However, not every student has access to climb to the top of the hierarchy, so those students are commonly directed to the social efficiency ideology. According to Schiro (2008), the purpose of schooling is to efficiently meet the needs of society by training youth to function as future members of society. The goal of educators is to find the most efficient ways to produce an educated person, using the objective scientific process of cause and effect. This trend is common with urban schools, where marginalized populations are not given opportunities to compete with the dominant culture (Woodson, 1933).

Both of these ideologies maintain the status quo. To change this domination, alternative ideologies must be explored. Freire (1970) coined this process as praxis, which asserts that, "Functionally, oppression is domesticating. To no longer be prey to its force, one must emerge from it and turn upon it. This can be done only by means of the praxis: reflection and action upon the world in order to transform it" (p. 51). Although this transformative moment will be uncomfortable for many educators, these moments are what Ladson-Billings (2008) found to be a compelling factor in teacher success with diverse groups of students.

Friere's (1970) critical pedagogy, and later ecopedagogy, would support a shift to Schiro's (2008) remaining two ideologies. The purpose of education for the social reconstruction ideology is to facilitate the construction of a new and more just society that offers maximum satisfaction to all its members. When considering the Earth as a member of a just society, this is in concert with reducing the impact of climate change. Another way to accomplish this would be to adhere to Schiro's (2008) learner-centered ideology where schools should be enjoyable places where people develop naturally according to their own innate natures.

Changing ontological underpinnings in the transmission of knowledge. Another way to consider how climate change would affect curriculum reflects on Null's (2008) transmission of knowledge. For simplicity, this section will focus on the teacher and student relationship related to curriculum. The contemporary US curriculum ontological approach is grounded in positivism. This philosophy focuses on establishing laws and assumes that reality is tangible. It is clear that the scientific method has directly

influenced this approach by requiring teachers to produce empirical and measurable evidence for learning.

This hierarchical top down approach to teaching has created a shift in many urban schools to a focus on controlling populations rather than exploring learning opportunities. "Most secondary schooling mitigates and governs the desires of its students in order to ensure safety, control, and the maintenance of hierarchical relationships" (Hobbel & Chapman, 2010, p.244).

The perceived need for structured and controlled teacher learner relationships are developed through the lens of the dominant adult paradigm. When discussing power-as-potential and the child, Baker (2001) states "The child has a capacity or potential for natural innocence that establishes the grounds on which civilization should seek its 'savage' roots and return to its state of nature, but not without the realization of the 'power' of the faculty of reason" (p. 285). This concept leads one to believe that humans' roots are with nature, but nature is savage and has no faculty of reason. The Eurocentric white culture believes that we must rescue the weak cultures, races and children who believe humanity could co-exist with nature and non-dominant cultures, instead of dominate them.

Friere's (1970) critical pedagogy would frame this as banking education, where the oppressor gives the oppressed the truth. Considering the oppressed and oppressor relationship: "In the banking concept of education, knowledge is a gift bestowed by those who consider themselves knowledgeable upon those whom they consider to know nothing" (p. 72). This type of education would be difficult to use if climate change was accepted as a truth, as it would conflict with the US cultural norms. Here is where Friere

(1970) offers an explanation as to why climate change has not been considered a national crisis, "Banking education (for obvious reasons) attempts, by mythicizing reality, to conceal certain facts which explain the ways human beings exist in the world" (p. 83).

In juxtaposition, Friere's (1970) problem-posing education offers an alternate, more constructivist approach to teaching and learning. Modeling cooperation and dialogue, the first step to create this change is to realize one's critical consciousness to begin the process of praxis. "In problem-posing education, people develop their power to perceive critically *the way they exist* in the world *with which* and *in which* they find themselves; they come to see the world not as a static reality, but as a reality in process, in transformation" (p. 83). Ecopedagogy uses problem-posing education, with the goal to transform the current planetary crisis.

Once "conscientizacao" has occurred, the next step of praxis is to take action against oppression. This support for the Earth must embrace critical pedagogical frameworks and include dialogue about privilege and justice. Before any change can be made, there must be awareness of and opposition to injustice. This is not an easy task and, " . . . it requires people to individually and collectively take stands to end oppression in private and public spheres, including gender inequity (Eisler, 2007) and violence toward the natural world (Selby, 2000)" (Joseph, 2011, p. 247). Although some believe high school students are not capable of such discussions, Freire (1970) believes, "This, then, is the great humanistic and historical task of the oppressed: to liberate themselves and their oppressors as well" (p.26).

Altering epistemological underpinnings from the dominant truth to holistic learning. This section begins once again by referring back to Null's (2008) definition of

curriculum, this time with a focus on who gets to decide what knowledge to prepare. Continuing with the contemporary philosophy of positivism, current creators of national curricular standards assert it has a value-free epistemology, and argue for all content in all schools to be the same. The achievement gap in U. S. schools is caused by the lack of quality content being taught, and the solution is to provide strict standards-based curriculum. It is not the knowledge that is off, but that schools are not teaching the same knowledge.

At the turn of the century, two dominant schools of thought emerged with juxtaposing epistemological and ideological stances. Thorndike (1906) viewed knowledge through a more quantitative lens and believed the transfer and acquisition of knowledge to always be specific and measurable. He took a deficit-based approach to instruction, and put a hard emphasis on learning the facts even if passion for learning was lost. "A gain in knowledge may mean a loss in health; to arouse ideals may mean less time for drill in correct habits; in zeal for the development of love of the beautiful the interest in the dry, cold facts of science may have to be neglected" (p. 5). There was a single truth to learn, broken into subjects, and they were important even if they were not exciting to the learner.

Dewey (1904/1959), on the other hand, took a more holistic epistemological stance. He believed in multiple truths and that ideas made sense as a whole. He began with a different view of science, "The universe is fluid and fluent; its contents dissolve and re-form with amazing rapidity. But, after all, it is the child's own world" (Dewey, 1990, p. 6). Believing in an asset-based approach, he also believed that tapping into students' passions and experiences was the best way for learning to occur. "The logically

formulated material of a science or branch of learning, of a study, is no substitute for the having of individual experiences. The mathematical formula for a falling body does not take the place of a personal contact and immediate individual experience with the falling thing" (p. 20).

Accepting climate change as a national crisis and embracing ecopedagogy would require a shift from Thorndike's (1906) "dry, cold facts of science" to Dewey's (1904) fluid and fluent universe, with the goal to help the Earth "re-form with amazing rapidity." Dewey refers to the tension between traditional and progressive education caused by varying moral perspectives of what is "right". Yet accepting multiple truths and shifting to a holistic approach is not enough to address the power shifts necessary to slow the climate change trend.

The majority of our knowledge is created by the dominant U.S. culture, and it will take much time and effort to unlearn this. To support this concept, Banks (2004) stated, "Groups with the most power within society often construct—perhaps unconsciously—knowledge that maintains their power and protects their interests" (p. 230). This paradigm shift would require an unlearning of some of the founding documents of our country, including the U. S. Declaration of Independence, which proclaims that "all men are created equal" and that they are "endowed by their Creator with certain inalienable Rights."

Accepting climate change is in direct conflict with the truth of the U.S. citizens' inalienable rights and freedom to strive for the American Dream. Freire (1970) describes what some call a throw away society in terms of oppression, "The oppressor consciousness tends to transform everything surrounding it into an object of its

domination. The earth, property, production, the creations of people, people themselves, time—everything is reduced to the status of objects at its disposal" (p. 58).

Bearing in mind, those in power get to determine curriculum content, so accepting climate change would become a journey to unlearn the truth that defines who they are. When discussing how the drive to consume has created identity, Freire (1970) believes, "For them, *to be is to have* and to be the class of the haves . . . they cannot see that, in the egoistic pursuit of *having* as a possessing class, they suffocate in their own possessions and no longer *are*; they merely *have*" (p. 59). Accepting climate change is one way for the "haves" to reach a critical consciousness , or "conscientization," and begin to unlearn their truth.

Reevaluating the axiological underpinnings of the institution. As defined previously, Null (2008) claimed that regardless of the shifting meaning, curriculum always referred to an "institution whose purpose is to educate" (p. 478). To explore axiological considerations, it is necessary to consider what values the institution has. Since 2001, US congress has supported NCLB, which asserts it is value neutral and supports standardized goals that can be predicted and generalized. This claim of objectivity is grounded in scientific methodology that also assumes all other variables are constant. However, there is a divide in the scientific community, and not all believe science can be objective.

In their book *Rethinking Scientific Literacy,* Roth and Barton (2004) provide several case studies to show "that critical scientific literacy is inextricably linked with social and political literacy in the service of social responsibility" (p. 10). They stress the importance of not just knowing science, but providing opportunities to take action.

> Human beings are endowed with a fundamental capacity: power to act, or agency. This capacity allows us to go beyond reacting to the environment: we actively change and shape the physical and social worlds that we inhabit (Roth and Barton, 2004, p. 11).

If the institution of the U.S. Department of Education accepted climate change as a national crisis, the values would shift to deconstruct the historical and cultural realities. The science behind the curricular change would need to shift from the physical to ecological, which would ultimately change the value of the curriculum. Historically, this question has been asked by Sears (1964) who wondered, "Is ecology a phase of science of limited interest and utility? Or, if taken seriously as an instrument for the long-run welfare of mankind, would it endanger the assumptions and practices accepted by modern societies, whatever their doctrinal commitments?" (p. 11)

Freire (1970/2005) supported the notion that we are moving regardless, and we are either moving to keep the dominant paradigm or to transform it.

> There is no such thing as a *neutral* educational process. Education either functions as an instrument which is used to facilitate the integration of the younger generation into the logic of the present system and bring about conformity to it, *or* it becomes 'the practice of freedom', the means by which men and women deal critically and creatively with reality and discover how to participate in the transformation of their world (p.14).

He further states that "conscientizacao" needs to apply to both the oppressors and the oppressed to take action, and that this onus is on the privileged to unlearn their oppressive ways of knowing in order to sustain change. Specific to climate change, the onus is on Western dominant culture to unlearn the consumer-driven, carbon producing "inalienable rights" rather than using them as justification to colonize other cultures. Critical EE researchers have already begun to take action moving in this direction (Kenis, & Mathijs, 2012; Malone, 2006; Prakash,1995).

Review of Literature: Section II

Significance of Ecopedagogy for Urban Educational Settings

Urban educational settings have been the birthplace of critical pedagogical movements, as educators have been trying to reach marginalized populations in meaningful ways (Ladson-Billings, 1994; Ye, Valrelas & Guajardo, 2011). Whereas this would seem a natural fit for the ecopedagogical movement, which is grounded in critical theory, the environmental focus is often void in many urban populations (Smith & Williams, 1999). Nonetheless, in order to truly create environmentally literate citizens who will work to change the oppressive habits of our dominant culture, people must willingly enter into the discussion in order to understand and believe we must change. Not designed to be a comfortable experience, as Giroux (1998) states, "Education works best when those experiences that shape and penetrate one's lived reality are jolted, unsettled, and made the object of critical analysis," (p. 132). Urban populations have already been presented with educational challenges, preparing them to be at the forefront of critical analysis of the dominant educational culture. This section of the literature review will explore ways embracing aspects of ecopedagogy will impact urban populations, including closing the local and global achievement gaps, providing culturally relevant pedagogy and creating collective, diverse and resilient communities.

Closing the Local and Global Achievement Gap

The impact of poverty and race on student performance and behavior in schools has been a controversial debate for decades. Although Colman's (1966) report supported the claim that race and poverty had little impact on student performance, many critical educators argue the data was misinterpreted by Coleman. For example, using

internationally comparative data with 40 countries, Wiseman's (2012) research supported the hypothesis that student poverty is one of the most significant influences on science teaching and learning.

Wiseman's (2012) research provides evidence that supports the idea that a shift of science curricula to allow students to develop their own projects might be a solution to increase science scores in high poverty populations. He also points out that an increase in science scores also contributes to community and national economic development. Therefore, for countries that have gaps in socio-economic levels, the emphasis on effective teaching curricula geared towards those in poverty will help to close both the achievement and economic gaps to help create sustainable communities.

These gaps faced by our country go beyond content specific issues, and extend to our approach to curriculum and education in itself. In *Cultures of Curriculum*, Joseph (2011) agrees that one reason we are teaching wrong is that we are avoiding the tough truths. Before any change can be made, there must be awareness of and opposition to injustice. This is not an easy task and, " . . . it requires people to individually and collectively take stands to end brutality in private and public spheres, including gender inequity (Eisler, 2007) and violence toward the natural world (Selby, 2000)," (Joseph, 2011, p. 247). Embracing ecopedagogy in education is a meaningful way to make learning more relevant to our urban youth, while empowering students to move towards peaceful and just healthy communities.

Empowerment: Power, Privilege, and Culturally Relevant Pedagogy

One of the issues our urban schools face is that the staff is predominantly white, whereas the student demographics are predominantly marginalized populations.

Therefore, there must be an intentional commitment to reverse the role of the colonizing effect of the educational system. The responsibility is on the oppressor, in this case the white teacher, to come to a critical consciousness and work *with* students to empower them to create change they want to see in their communities.

With this in mind, schools embracing an ecopedagogical praxis should work to embrace the overarching tenets outlined by Ladson-Billings (2008) chapter on Culturally Relevant Teaching (CRT). These include:

1. Students whose educational, economic, social, political, and cultural futures are most tenuous are helped to become intellectual leaders in the classroom.
2. Students are apprenticed in a learning community rather than taught in an isolated, unrelated way.
3. Students' real-life experiences are legitimized as they become part of the "official" curriculum.
4. Teachers and students participate in a broad conception of literacy that incorporates both literature and oratory.
5. Teachers and students engage in a collective struggle against the status quo.
6. Teachers are cognizant of themselves as political beings (p. 127-128).

The CRT tenets set forth by Ladson-Billings (2008) have a place in all educational settings, however subject-specific courses at higher levels make it more difficult for teachers to embrace them. Through their research on subject-matter experts in urban schools, Ye, Varelas and Guajardo's (2011) grounded theory research related two teaching fellows experiences to Ladson-Billing's tenets of culturally relevant pedagogy (CRP). The study helped "unearth and document ways in which educators' identities, culturally relevant pedagogy, and urban schools intersect and interact with each other," (p. 873).

In an unusual case, Ye, Varelas and Guajardo's (2011) study followed two math and science teaching fellows through a CRP lens. The math fellow taught at an urban elementary school, whereas the science teacher taught a 9th grade class at a 95% low-

income urban school. It explored the experiences and challenges faced by subject-specific science and math majors when trying to explore urban teaching and CRP.

This study found that educators' identity is a particular theme that is played out over and over, and it is difficult to integrate all tenets of CRP. "The present study helps us shed more light on the intricacies of a student-centered approach using the lens of culturally relevant pedagogy and appreciate the complexities of each of its tenets and their interplay," (p. 874). Indeed, the intricacies of student-centered teaching and culturally relevant pedagogy are complex, and this complexity is compounded by the addition of a school-wide adherence to an ecopedagogical praxis for teaching and learning.

Critical leaders in educational reform argue for trustworthiness. Anyon's (1980) work on the hidden curriculum is easily transferred to concepts of hidden research agendas. Considering much of the academic research is funded through corporations and educational agendas with outcomes in mind, pretending to be objective seems to be dishonest. Freire (1970/2005) makes the argument that education is not neutral, and without intentional discussion of subjectivity, research supports the status quo. With this in mind, Apple (1995) encourages all people who have agency to use their power to add to the educational research pool.

Transformation: Collective, Diverse and Resilient Communities

Reflecting on Hovardas' (2013) beliefs, as well as the current research on climate change, we must work to transform our thinking to embrace a global understanding of human society as the object, where the Earth remains the marginalized subject. Considering this, of all the critical issues working towards resolution, schools embracing

ecopedagogy must believe the planetary crisis is pivotal. This does not negate the serious concerns brought forth by critical race theory, critical feminist theory, or queer theory, but rather puts an international, global perspective on the most prevalent marginalized entity: The Earth.

Yet we cannot forget the individuals. As Antunes and Gadotti (2005) argue:

> Ecopedagogy is a pedagogy centered on life: it includes people, cultures, *modus vivendi*, respect for identity, and diversity. It understands the human being in evolution, as an 'incomplete, unfinished, and non-conclusive' being, as stated by Paulo Freire—a being in continuous development, interacting with others and the world (p. 137).

What better place to explore ecopedagogy than our diverse urban schools? Societies must work as a collective of transformative individuals that value all individuals to work towards authentic change. Essentially scaffolding worth for individual, community and Earth, the self-worth plays a crucial role in our ability to transform (Davis, 2013; Dyment, & Reid, 2005). Agyeman (2005) suggests we need to move beyond multicultural communities, and learn to value the diverse urban populations to create intercultural communities. Learning to value and have dignified interactions and meaningful dialogue will be critical to the next phase of 'planetary civilization' (Antunes and Gadotti, 2005; Freire, 2005).

Youth Participatory Action Research

Youth Participatory Action Research (YPAR) goes beyond researching by providing opportunities for youth to study relevant social problems and work towards ways to rectify them (Cammarota and Fine, 2008). "YPAR teaches young people that conditions of injustice are produced, not natural; are designed to privilege and oppress; but are ultimately challengeable and thus changeable," (Cammarota and Fine, 2008, p.5).

Furthermore, using YPAR will help to operationalize Creswell's (2013) advice to stage the project so that the results will be of benefit to the participant more than, or at least equal to, the researcher. Additionally, this result should have a longstanding result in order to be truly valuable to the participants.

Although there are not a great deal of case studies of YPAR relating to environmental issues, there are several cases where Participatory Action Research (PAR) is used. The main argument of Ballard and Belsky's (2010) research was that PAR is a valuable tool to both increase environmental literacy and increase resiliency of marginalized Latino populations. The authors use an adapted version of Berkowitz, Ford, and Brewer's (2005) interdisciplinary model of environmental literacy, which includes: ecological literacy, civics literacy, values awareness and self-efficacy. The authors also discussed how it was not easy to get the members of the marginalized populations to participate, sharing that:

> An important lesson for environmental educators is to heed the call inherent in resilience thinking to pay close attention to the complexities and politics of social–ecological systems change. This entails examining conditions and implications of unequal resource access and vulnerability that characterize many of the communities who live with or collect natural resources, as well as the multiple factors that foster or impede institutional change in particular locales (Ballard and Belsky, 2010, p. 624).

With unequal power dynamics comes an understandable lack of trust from marginalized populations. In Ballard and Belsky's (2010) case, PAR demonstrated the benefits of a more democratic approach to knowledge production, located outside formal classrooms, involving a more dialogue-centered and collaborative approach to research (p. 624). This dialectic approach is further supported by Hsu's (2009) research, that suggests "…that if environmental educators can understand the kinds of life experiences

that motivate environmental action, they would be better able to foster the development of an active and informed citizenry in the next generation," (p. 497). For this study, YPAR is explored as not only a research methodology, but also as a curriculum model to encourage empowerment and transformation.

Gaps in the Literature

Although international EE research is beginning to address critical aspects of curriculum, there is an extensive gap in critical EE research in the US. Additionally, there are few researchers focusing on ecopedagogy in the US, and none of these researchers are focused on secondary education (Bowers, 2006; Kahn, 2010; Saxton, 2011). Furthermore, the majority of this research is focused on the theoretical aspects of ecopedagogy rather than exploring ecopedagogy in action.

This review also suggests a gap in the literature around effective science education that incorporates social justice issues. In order to embrace this type of change, we must model it in our classroom by developing respectful learning communities. Santos (2008) adds,

> "In addition, some of those curricula proposed take into consideration the aim of science education to prepare students for social responsibility, responsible sociopolitical action; they also reinforce the purpose of developing attitudes and values to help students engage in social issues (e.g., Cross & Price, 1992, 1999; Frazer & Kornhauser, 1986; Ramsey, 1993; Roth & Lee, 2004; Waks, 1992)," (p. 362).

Whereas Cammarota and Fine (2008) are leading the way in providing youth opportunities to take action for social justice, and Barton (2003) incorporates science into the mix, there are few examples of curriculum designed to allow urban youth to take action for environmental change. Indeed, one of the general agreements among the scholars regarding the evolution of environmental education as a field and science

education is that neither have been effective at reaching marginalized, urban populations. Furthermore, the US needs help to gain scientific and environmental literacy, and there is an even wider gap related to marginalized populations. Finally, it is generally agreed that EE and science need to be taught differently in order to reach these populations. However, there are some disagreements as to how to approach these issues.

One major disagreement stems from what place-based education means. Some researchers view getting students out into the wilderness as a key factor in ecological and scientific literacy (Chawla, 2001). In juxtaposition, other researchers have found it necessary to first appreciate local natural communities or the impact could be counter-productive.

Perhaps the most important disagreement regarding this research surrounds the philosophical approach. Just as science is often thought of as an objective field, so is the approach to EE. Rather than discuss root problems, many researchers feel in is inappropriate to share their bias, and that teachers need to be objective. However, ecopedagogy as a critical theory states it is necessary to address injustice and privilege. Additionally, the offshoot of eco-justice has incorporated taking action to try to address these injustices.

Finally, whereas many of the studies above provide support for the need to shift the way we teach to make science and education for sustainability relevant to urban students, there are few that offer examples of how to accomplish this. Much of the research around this topic hovers in the theoretical, particularly in the United States (Gough, 1999; Dimitriadis, 2005; Dillan & Wals, 2013). This is understandable, as it is coming from the top and is supporting the need for creative alternatives to come from the

marginalized communities themselves. However, when these are created, there are not studies being done to add them to the research base on an academic level. Therefore, one critique of this review is that it focuses on academic research but is seeking examples of effective strategies created by marginalized organizations.

Arguably the main flaw in the US-based research is the lack of representation of marginalized populations as researchers. It is important to note that the leading ecopedagogical researchers in the US, Kahn, Saxton and Bowers, all fit into the dominant white culture. However, the gap in the literature may not reflect the actual gap in effective science and sustainability teaching strategies, but rather a gap of academic reporting about these efforts.

Summary

To summarize, research supports the need to shift the way we teach and learn in order to address climate change. Students should be given the opportunity to take action related to the context they are learning in as it relates to their communities through praxis. This praxis is not linear, but a recursive process that involves a spiral of steps that include: Questioning an issue that is of interest to a student, reflecting and investigating the issue, creating a plan of action, and finally implementing that plan (McIntyre, 2008). Similar to Scientific Inquiry, it is the process that is critical to this type of research and more questions will develop. Taking into consideration that Freire's "conscientizacao" should apply to both the privileged and the oppressed, dialogue, respect and action needs to occur by the privileged to unlearn our oppressive ways.

In order to embrace this type of change, we must take action and model it in our classroom and with our research by developing respectful learning communities.

Furthermore, the lack of relevance of science and EE for our marginalized populations transcends much of our academic systems. It is impossible to include our urban populations while holding a neutral standpoint with environmental issues, and the outdated "separate hat" approach to being an environmental educator, not an environmentalist, must change to embrace the 21st Century (Hungerford, 2010). In *Cultures of Curriculum*, Joseph (2011) agrees that one reason we are teaching wrong is that we are avoiding the tough truths. Before any change can be made, there must be awareness of and opposition to injustice. This is not an easy task and, " . . . it requires people to individually and collectively take stands to end brutality oppression in private and public spheres, including gender inequity (Eisler, 2007) and violence toward the natural world (Selby, 2000)," (p. 247). Embracing ecopedagogy praxis into education is a meaningful way to make learning more relevant to our urban youth, while empowering students to move towards peaceful and just healthy communities.

Educational researchers and practitioners need to be courageous and respond to this global crisis by taking action to shift our educational practices to include ecopedagogy, anticipating surprises by educating diverse, resilient people prepared for 'planetary civilization' (Antunes & Gadotti, 2005).

This study examines how students at one urban high school, Escuela Verde (EV), take up these ontological, epistemological and curricular changes through Youth Participatory Eco-justice Action Research (YPEAR) projects and the effects on their environmental literacy.

Chapter Two

Setting: Escuela Verde as a Site for EfS and Ecopedagogical Praxis.

Escuela Verde's vision is to cultivate a community that is participatory, just, sustainable, and peaceful. This vision becomes manifest by: graduating reflective high school students prepared to live happy, healthy, meaningful lives; Collaborating with the community to create a strong sense of place and skills to flourish without harm; Providing staff who model our vision and embrace education as liberation; Engaging urban youth by adhering to an ecopedagogical praxis.

Although grounded in an innovative school design, Escuela Verde (EV) is a TransCenter for Youth, Inc. public 2R charter school contracted through the City of Milwaukee's common council, and therefore must adhere to all local, state and federal educational mandates. EV's report card and scorecard are based on all of the state and local graduation requirements. This includes state test scores, local test scores, credit earnings, contact hours, teacher certifications, enrollment policies, special education services, and so forth. The school uses the Common Core (CC) and Next Generation Science Standards (NGSS) integrated into student projects to provide rigorous content expected of high performing high schools. Whereas the primary ideology of the school is a blend of social reconstructivist and constructivist, all of the services and quantified measures of students as academic scholars are provided to the state for external validation (Schiro, 2008).

The school is also working towards internal trustworthiness measures more in concert with the ideologies of the school (Wise & Fine, 2004). Our collective learning community includes researchers, educators, parents, community members and students,

who engage in ongoing dialogue around, their own set of measurable outcomes philosophy, pedagogy, and action as they work toward planetary citizenship.

One way of accomplishing this is through creating a democratic learning environment where learners and advisors work together, openly and transparently, to manage the school. There is no principal at the school, rather six advisors share administrative and teaching duties. Advisors go by first names, and they fully support and expect a strong, active, participative student governance group. In order to help organize the administrative responsibilities, they bi-annually adjust and follow the chart below.

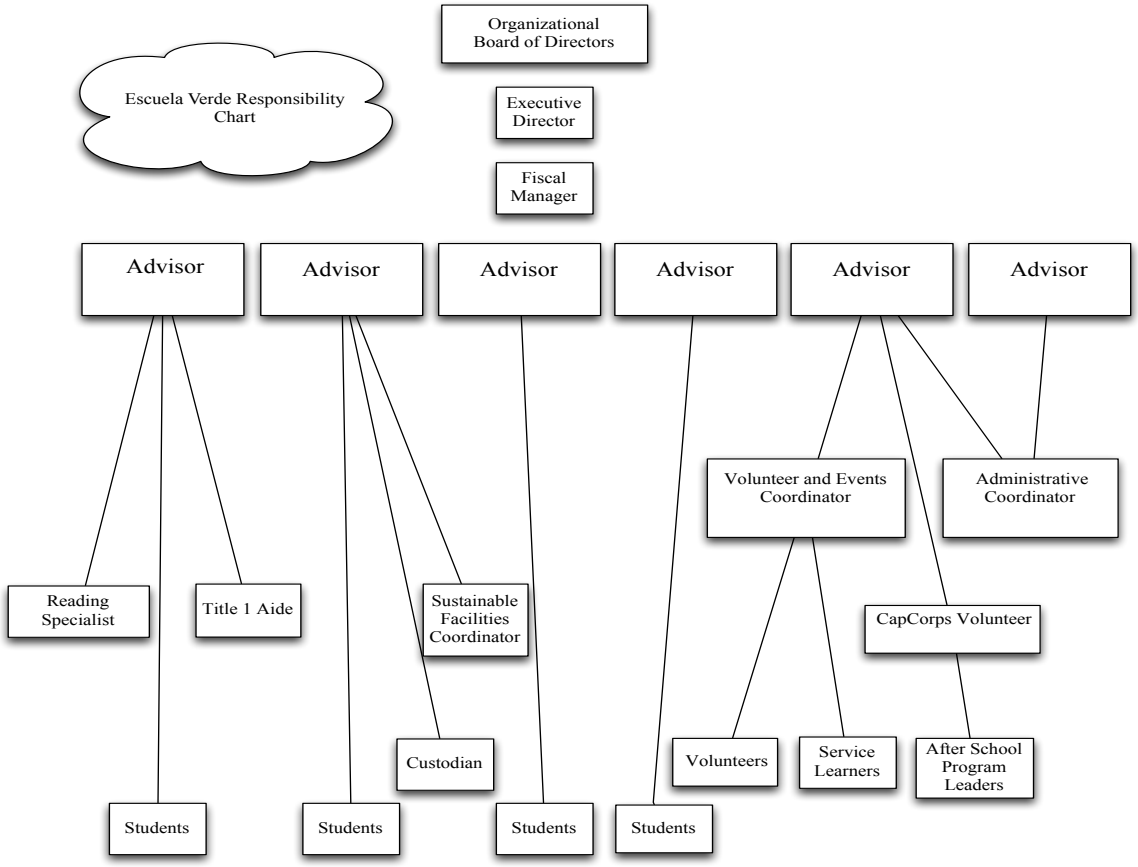

Figure 2.1*: Escuela Verde's Advisor Collective Responsibility Chart*. This figure represents the six advisors who work as a collective to run the school. This chart is not meant to depict who has power, but rather who is responsible for making sure various administrative aspects are completed.

Modeling cooperative leadership is one way to begin to break down barriers to adult/adolescent trust. Even the urban adolescent participants in Wallace and Chhuon's (2014) study who no longer viewed themselves as children, "understood that the inherent, and inevitable, youth-adult hierarchy existed in schools" (p. 957). Regardless, adolescents in their study wanted to "be acknowledged as vital partners in the teaching and learning process" (p. 957). One component EV has in place to acknowledge this partnership is an annual winter strategic planning retreat, where staff and seniors have the opportunity to reflect and adjust the school's vision and mission. Each year, the vision and mission of the school have changed to reflect the current student and staff beliefs. However, the staff typically leads this discussion, and could take Wallace and Chhuon's (2014) findings seriously by listening to the students more often.

During the 2013-2014 school year retreat, the vision discussion focused heavily on the international Earth Charter. Drawing on the knowledge, skills and dispositions outcomes derived from the framework for environmental literacy NAAEE suggested to PISA (*PISA*), Escuela Verde's vision and mission (*EV*), and Antunes & Gadotti's (2005) suggestion of ecopedagogy for the Earth Charter (*EC*), the EV learning community empowers students to enter into a collaborative journey toward environmental literacy. To accomplish this, there is ongoing dialogue around philosophy, pedagogy and action in order to work towards planetary citizenship.

In addition, the school-wide curriculum itself provides a foundation for transformative learning. These opportunities come in the form of curricular lenses, Education for Sustainability (EfS) advisory themes, action-based research workshops, and the senior thesis YPEAR project.

The EV curriculum. Whereas the YPEAR project is a three-credit senior undertaking, it is important to first explore the curriculum designed to scaffold students' environmental literacy prior to their senior year. To solidify the school focus of sustainability and restorative justice, EV has three curricular lenses integrated throughout the school year: Ecology, justice and peace. Each of these lenses is further divided into three levels of understanding: Individual, community and biosphere. Figure 2 illustrates the three curricular lenses of justice, ecology and peace and the three supporting levels of understanding. Chapter four examines the philosophical roots, supporting research, relevant curricular approaches, and anticipated outcomes of these three lenses.

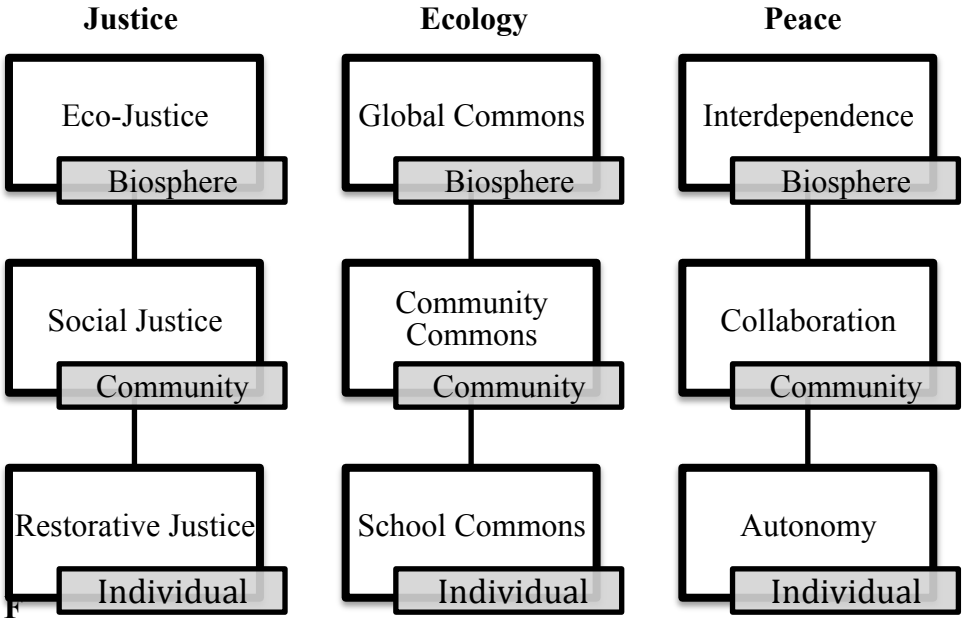

Figure 2.2: *Escuela Verde Curricular Lenses*. This figure represents the individual, community and biosphere levels of the justice, ecology and peace lenses EV uses when developing curriculum.

Another form of school-wide curriculum dedicated to EfS is advisory time. In addition to morning and afternoon check-ins, multi-age advisories of up to twenty students meet for thirty minutes every day. These advisory workshops are dedicated to work on climate aspects of the school, while scaffolding skills and behaviors to help

students become exemplary project-based learners. Integral to this process are quarterly EfS themes that were developed by the staff from several sources including the Wisconsin Center for Environmental Education and the Cloud Institute for Sustainability Education. A detailed list of these themes with objectives can be found in Appendix A.

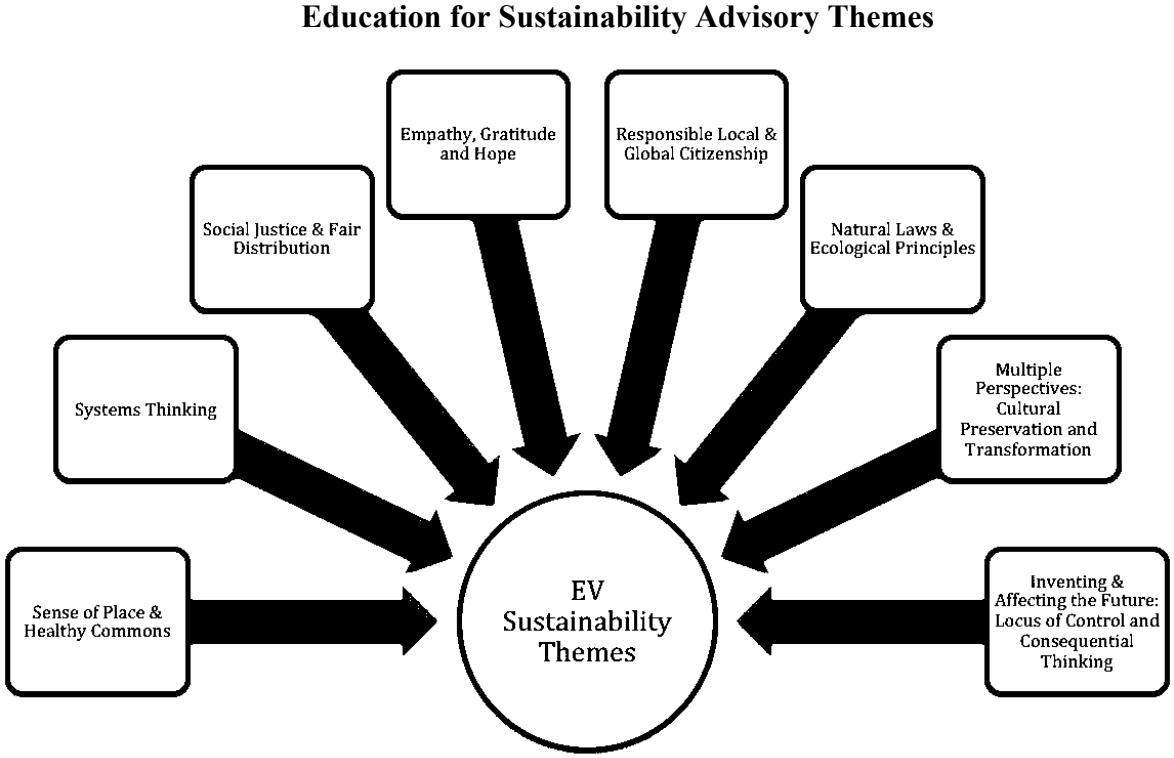

Figure 2.3: *Escuela Verde's Education for Sustainability Themes.* This figure represents the eight sustainability themes that are featured over the course of two years. It is believed that each of these themes plays a critical role in being a part of a sustainable community.

A third way the school's curriculum makes it a good fit for this study is its commitment to an action-research model. Although the goal is to nurture student-centered projects, the transition often takes time. Therefore, the staff models this six-phase research-based approach, which was developed by pulling from and combining five curricular and research frameworks: EdVisions senior project, service learning, Ecopedagogical praxis, Youth Participatory Action Research and the dissertation process.

The six-phase research-based approach of quality workshops includes: Logistical background information, research interests and investigation, action planning and research methodology, action and data collection, analysis and reflection, and presentation, demonstration and celebration.

These six phases provide a framework for quarter and yearlong projects, and are a critical component to the senior thesis projects. For a more detailed look at how these lenses, themes and action research approach are integrated into the curriculum, see the document "Writing Objectives and Unit Plans using EV's Curricular Lenses and Themes" in Appendix B.

Finally, the unit of analysis for this study, the senior thesis YPEAR project, is unique to this site. In an attempt to put theory into practice, the school created a 3-credit Youth Participatory Eco-justice Action Research (YPEAR) project designed to be integrated into the Senior Thesis graduation requirement. In addition to content-related standards, the objective of the senior thesis project is to provide authentic experiences for our students to realize and embrace their humanness by allowing learning to be relevant to their lives. For more details about this project, see the senior thesis YPEAR guidelines in Appendix C.

Escuela Verde is in its third year as a public charter school authorized by the Common Council of the City of Milwaukee. The current population is 78 students, grades 7-12. As documented above, the main reason this site was selected was because the staff adheres to an ecopedagogical praxis for teaching and learning, with a vision to cultivate a community that is participatory, just, sustainable, and peaceful. The curriculum is based

around this vision, and the school requires a 3-credit Youth Participatory Eco-justice Action Research (YPEAR) senior thesis project for graduation.

A secondary reason this site was selected is that it is located in an urban, predominantly Latina/o neighborhood. Finally, this research location was selected in large part because of convenience, because it is the school where I am employed. Therefore, much consideration has been taken to articulate the various positions of the researcher in this study. This positionality is discussed, at length, in the Chapter Three: Research Methodology.

Chapter Three

Research Methodology

> [N]o one can say a true word alone – nor can she say it for another, in a prescriptive act which robs others from their words… . How can I dialogue if I am closed to – and even offended by – the contribution of others? … At the point of encounter there are neither utter ignoramuses nor perfect sages; there are only people who are attempting, together, to learn more than they now know (Freire, 2005, 88)

As a novice researcher, I by no means entered into this study as a sage, but rather as a participant with a desire to understand how the process of seniors participating in a senior thesis project affected the participants' environmental literacy. Specifically, the purpose of this qualitative exploratory case study is to describe the holistic and detailed ways Youth Participatory Eco-justice Action Research (YPEAR) projects affect environmental literacy in urban high school seniors at Escuela Verde, a public charter school in Milwaukee. The YPEAR project will be generally defined as a senior thesis, a three-credit graduation requirement that integrates project-based learning, eco-justice research and youth participatory action research.

As discussed in previous chapters, this research is grounded in a worldview that embraces the notion that there are multiple realities and/or truths. In chorus with a transformative and postmodern philosophy, the theoretical framework used by this project will be Freire's ecopedagogy. Applying an ecopedagogical praxis, teachers as well as learners examine systematically their own oppressor-oppressed roles as members of a particular unsustainable modern community/culture.

One of Freire's (1970) last great contributions, ecopedagogy provides a framework for this discourse, as he added the Earth to his list of oppressed populations. In doing so, he suggested educators dedicated to liberation shift to an ecopedagogical

praxis. Although ecopedagogy is gaining in popularity as a philosophy on a global level, we know little about if and how it contributes to secondary student's environmental literacy when put into action. Through exploratory case study design, the primary research question explored in this study is how does youth participatory eco-justice action research (YPEAR) affect the development of environmental literacy in urban high school students? This chapter begins by outlining the ethical reasons for selecting the methodological approach, and is followed by: a detailed description of the site, the qualitative case study design, trustworthiness and credibility measures, ethical issues and limitations of the study.

Commitment to Decolonizing Qualitative Methodologies

To begin, considering the audience of this research is predominantly marginalized populations found in urban settings and I am a white researcher, it is necessary that cultural oppression also be included in the discussion in order to make environmental literacy relevant. There has been much attention recently to the oppressive capacities of research. In her book, *Methodology of the Oppressed,* Sandoval (2000) discusses a differential form of consciousness and social movement involving marginalized populations.

One chapter provides an interesting analogy by discussing the downfall of the feminist movement, due to people splitting into their own forms of feminism and alienated other feminists. Rather than alienation she suggests a separate fifth movement of feminism that combined all the previous movements. Through this, Sandoval (2000) warns against entering into the methodological approach of overly defining boundaries and choosing a “right” approach. Every situation calls for different approaches, and at

times a blending will provide the best result. In similar fashion, Creswell (2011) considers mixed methods research the "'third methodological movement' following the developments of first quantitative and then qualitative research," (p. 1). Although this study will only involve qualitative research designs, it follows the same debunking of the either/or binary as it examines Youth Participatory Action Research as a curricular model through an exploratory case study.

In addition to this fluidity, Smith's (2012) *Decolonizing Methodologies: Research and Indigenous Peoples* solidifies the need for transparent research methodologies when working with marginalized populations. This is particularly relevant for researchers of the dominant culture committed to decolonizing methodologies. The goal is not only to highlight truthfulness to research readers, but also to be truthful and transparent with the populations being researched.

> Indigenous methodologies tend to approach cultural protocols, values and behaviors as an integral part of methodology. They are 'factors' to be built into research explicitly, to be thought about reflexively, to be declared openly as part of the research design, to be discussed as part of the final results of a study and to be disseminated back to the people in culturally appropriate ways and in a language that can be understood.—(Smith, 2012, p. 16)

Smith (2012) continues to point out that this does not mean researchers should not publish in academic journals, or abandon academia altogether. Rather, speaking in an appropriate language for the people who are being studied is just part of an ethical and respectful approach.

Recently there has been a call to action for critical Environmental Education (EE) research from the international EE community. This new direction began to emerge internationally in the late 1980s with Australia, Canada and South Africa leading the way

to what is considered a more holistic theoretical approach (Stevenson, Dillon, Wals, & Brody, 2013). Stirred in part by the groundbreaking debate of Mrazek (1993) and Robbottom & Hart (1993), editors Stevenson, Dillon, Wals, & Brody (2013) believe the *International Handbook of Research on Environmental Education* illustrates, "how far environmental education research has evolved from an applied science positivistic orientation dominated by efforts to identify relationships among environmental knowledge, attitudes, and behaviors (Hart & Nolan, 1999; Rickinson, 2001) to a range of more diverse approaches" (p. 513). This research provides an example of an intentionally more diverse approach, understanding the risk that it may lose credibility with the U.S. EE community.

While recognizing this, there are several qualitative EE research studies to support this shift in the recent years. From Africa, O'Donoghue & McNaught's (1991) research on EE through 'grass roots' reconstructive action was published in the *International Journal of Science Education.* Chiotha (2010) explores two case studies at African universities who are attempting to mainstream environmental and sustainability education. The authors claim that past attempts to address these issues were skewed and marginalized people's needs were left unmet. These case studies show that although there are good attempts to mainstream environment and sustainability programs, there are still many challenges to be refined, particularly with marginalized populations. "If there is failure to consider the needs and rights of local people, the latter may respond in ways that undermine the environmental goals of particular programs, through apathy or non-cooperation, the growth of illicit activities, or more overt forms of conflict (Agg and Utting 2002)," (Chiotha, 2010, p. 294).

Indeed, the lessons learned from this research highlight the challenges of the first two years of implementation, as stakeholders from the research and community farmers alike were concerned the project would compromise their livelihoods. The recommendation was made to change the strategy of how to approach the research so that stakeholders feel they are part of the decision process.

Through their qualitative analysis, Feng (2012) concluded that western educators for sustainability (EfS) do not spend enough time focusing on the importance of cooperation and collaboration with their students. An important distinction, Feng (2012) took time to articulate the difference between multidisciplinary and a more holistic interdisciplinary. Specifically, the author emphasized that interdisciplinary curriculum took time to cooperate and analyze information together, to become a 'community of learning'. Similar qualitative case studies have began to emerge as acceptable 'community of researching' approaches in EE (Pauw & Petegem, 2012; Sandell & Öhman, 2010; Wals & Alblas,1997). This study proposes working with the democratic school community to help collect data that best represents what is happening.

Another shift focuses qualitative research studies incorporating action research. Hart, Robottom & Taylor (1994) carried out a case study on the dilemmas of participatory enquiry and several Participatory Action Research studies addressing forests and indigenous cultures have been published. (Ballard & Bensky, 2010; Brydon-Miller, Kral, Maguire, Noffke & Sabhlok, 2011). Engaging youth as a means to address environmental citizenry has also began to take root in the research (Hashimoto-Martell, McNeill & Hoffman, 2012; McNaughton, 2010; Schusler, Krasny, Peters & Decker, 2009).

Although not opposed to quantitative research, Hart's (2000) underlying beliefs were that researchers should 'appreciate the independent and interrelated roles of ontology, epistemology and methodology in rendering more transparent these issues' (Hart, p. 38). Therefore it is important that the reader understands the philosophical rationale behind the practitioner-researcher choosing this methodology.

This research is grounded in ecopedagogy, a form of critical theory that integrates cultural relevance and social justice into the fields of environmental education and education for sustainability. Applying Freirean critical pedagogy, teachers as well as learners, examine systematically their own oppressor-oppressed roles as members of a particular unsustainable modern community/culture.

Gadotti (2011), a colleague of Freire, states that ecopedagogy gives, "… a chance for education to renew its old systems, based on competitive principles and values. Introducing a culture of sustainability and peace into school communities is essential so that these communities can be more cooperative and less competitive," (p.22). Beyond traditional environmental education, ecopedagogy embraces the aspects of critical pedagogy, making it relevant and effective at reaching urban populations (Aguirre-Bielschowsky, Freeman, and Vass, 2012; Agyeman, 2005; Barton, 2003; Bowers, 2006; Chiotha, 2010; Feng, 2012; Khan, 2010). Even so, there are no studies to date showing the impact of embracing an ecopedagogical praxis on any US secondary schools, in part because they are difficult to find.

Qualitative Research Design: Exploratory Case Study

Considering the research question explored in this study explores how youth participatory eco-justice action research (YPEAR) affects urban high school students'

environmental literacy, qualitative case study research approach is the appropriate choice. Specifically, this section offers support as to why the case study approach, qualitative research design and Participatory Action Research (PAR) are appropriate choices for addressing this research question.

To begin, this research question explores a defined case, making case study researching the best fit. According to Yin (1994), "A case study is an empirical inquiry that investigates a contemporary phenomenon (the "case") in depth and within its real-world context, especially when the boundaries between phenomenon and context may not be clearly evident" (p. 16). For this study, the unit of analysis is the YPEAR senior thesis project, and this is what will be explored in the real-world context of the school.

Merriam (1998) points out that, "Unlike experimental, survey, or historical research, case study does not claim any particular methods for data collection or data analysis," (p.28). Although there are quantitative and qualitative approaches to case study research, there are three major distinctions that make qualitative case study the appropriate choice for this research study: the purpose, the role of researcher, and the construction of knowledge. Quantitative inquiry has the purpose to find explanations whereas qualitative inquiry has the purpose of understanding. As Merriam (1998) suggests, determining when to use a case study approach to research design depends on what the researcher wants to know, and Yin (1994) suggests "how" and "why" questions are particularly well suited for case study research. In this study, the research question is seeking to find information related to how the YPEAR senior thesis project affects students environmental literacy, making the qualitative case study approach appropriate.

The next distinction is the role of the researcher. Quantitative researchers strive for an impersonal role while qualitative seeks a personal role. As both the researcher and practitioner, it would not be possible for me to have a truly objective, impersonal role with this study. Therefore, having a personal role as a researcher would make qualitative the appropriate choice for this study. The final distinction is between knowledge discovered and knowledge constructed (Stake, 1995, p.37). Grounded in constructivist epistemological underpinnings, this research seeks to construct knowledge from an interaction between experiences and ideas generated from this research.

The qualitative case study must be very clear about its unit of analysis, or the major entity that is being studied, such as an individual, or groups of individuals, or social artifacts. The unit of analysis for this study will be the YPEAR senior thesis project. The key to defining a case is by bounding it. This will help distinguish data about the subject of the case study, or the "phenomenon," from the data external to the case, or the "context". This will include specific participants, locations and time boundaries for the beginning and the end of the study (Creswell, 2013).

When considering what type of problem best suited for case study design, it is important to think about what the ultimate focus of the study is. For a case study, the goal is to providing an in-depth understanding of a case using thick, rich description (Glesne, 2011). This study will include multiple data collection sources including student and alumni interviews, audio recorded discussions with seniors and staff, video archive reviews of past senior thesis presentations, and a records review of existing school curricular documents and Senior Thesis Posters. This data was analyzed through

description of the case and themes of the case. This process provided an in-depth, thick description for the final written report that draws the reader in (Glesne, 2011).

However, simply following the steps of qualitative case study research is not enough to make an exemplar case study. Yin (1994) describes five general characteristics that differentiate a complete case study from an exemplar case study which include: significance, completeness, consideration of alternate perspectives, significant evidence and composition in an engaging manner (p. 201-206). The section that follows will demonstrate how this study will address these characteristics.

The first characteristic of a high quality case study is significance. Yin (1994) posits there are two key avenues in selecting a significant case. First, "The individual case or cases are unusual and of general public interest," and second, "the underlying issues are nationally important—either in theoretical terms or in policy or practical terms" (p. 201). This study addresses both of these needs, as there have been no known studies of ecopedagogical praxis in action in a US secondary school. Additionally, Chapter One outlined the significant need of climate change as a national and international concern.

Another characteristic of a high quality case study is completeness. Although difficult to describe operationally, Yin (1994) describes three guidelines to create a complete study. To begin, he believes, "the complete case is one in which a researcher gives clear attention to the boundaries of the case—that is, the distinction between the phenomenon being studied and its context" (p. 202). In this study, the YPEAR senior thesis project is the phenomenon being studied, and it has clear boundaries in place.

Another guideline to help create a complete study is that it should, "demonstrate convincingly that the researcher made an exhaustive effort to collect all the relevant evidence" (Yin, 1994, p. 203). As all possible stakeholders who work with the YPEAR senior thesis project, including seniors, alumni and staff, will have an opportunity to be interviewed, I will be attempting to collect all the relevant evidence. Moreover, additional archives and documents will be reviewed to add to the depth of evidence.

One last way to create a complete study is to avoid certain artificial conditions. "When a time or resource constraint is known at the outset of a study, the responsible researcher should design a case study that can be comfortably completed within such constraints, rather than being artificially limited by them," (Yin, 1994, p. 203). As this study is part of a dissertation process, there is a limiting factor of time. In an attempt to be proactive with this limitation, data was collected from alumni and current seniors to gain perspective from those who have completed as well as those students who were currently in the process of completing their YPEAR project. Specifically, in order to gather data from different levels of the process, data was collected during staff and student planning meetings, through mid-year interviews with current seniors, and through alumni end of the year exit interviews.

A third characteristic of a quality case study includes consideration of alternate perspectives. Yin (1994) states, "the examination of the evidence from different perspectives will increase the chances that a case study will be exemplary" (p. 203). Through interviews, these perspectives may be found in variations among the student, alumni and staff stakeholders who are part of the case study. This process allowed for alternate renditions covering the same YPEAR case.

Displaying sufficient evidence is another characteristic of an exemplar case study. Yin (1994) states, " The exemplary case study judiciously and effectively presents the most relevant evidence" (p. 205). One way this case study is prepared to address this is through presenting the information using the "Rashoman Effect." Wolcott (1994) suggests using this technique to tell the story of the information through different perspectives.

Arguably the most important characteristic of an exemplar case study is providing composition in an engaging manner. Admittedly, this will be one of the greatest challenges for me as a novice researcher, as Yin (1994) emphasizes, "the production of such seductive writings calls for talent and experience" (p. 206). In an attempt to address this, I followed his recommendation to rewrite to increase clarity and to use my committee members as reviewers.

Merriam (1998) believes, "Because of its strengths, case study is a particularly appealing design for applied fields of study such as education" (p. 41). Collins and Noblit (1978) call this type of research *field studies*, and add, "field studies are better able to assess social change than more positivistic designs…" (p. 26). Action research can be considered a more contemporary version of Collins and Noblit's (1978) *field studies*, and will be explored below.

Participatory Action Research (PAR), by definition, uses praxis and this fluidity requires many changes along the way in order to honor suggestions, input and knowledge gained by the participants. A case study, on the other hand, is bound by certain parameters including a specific unit of analysis, specific participants and time boundaries for a beginning and end. Although limiting, these bindings help distinguish data about the

subject of the case study (the "phenomenon") from the data external to the case (the "context") and provide research that is more commonly accepted in the academic community (Stake,1995; Stringer, 2007).

In concert with the supporting PAR studies, research also shows that incorporating Youth Participatory Action Research (YPAR) with marginalized urban populations is key to the success for true environmental literacy (McIntyre, 2008; Cammarota and Fine, 2008; Ballard and Belsky, 2010; Fleer, 2009; Roth and Barton, 2004; Santos, 2008). This is often due to students doing research about things they are interested in, and this shift in relevance and power are transformative for learning.

Unfortunately, as Dimitriadis (2005) points out, the most marginalized populations are continually silenced through practices that keep them under constant surveillance. He expounds, "accountability" has become the watchword for policing what education can mean for youth in state-funded institutions. The tragedy here, of course, is that affluent students can often attend private schools, where student-centered learning is often enabled by material privilege" (p. 234). YPAR gives a voice to those who need it most, and should be considered a particularly valuable curriculum model for urban schools that practice democratic learning communities.

Whereas YPAR studies have begun to emerge in the literature as a means to offer an alternative approach to create such collective change that address collective issues, there are not many cases of the research developed through YPAR as adding much to empirical research knowledge base. One field worth exploring more is the work being done through citizen-science, as non-experts collect data that contributes to the scientific data sets.

Above all, when considering why this approach is being used, Anderson & Herr (2005) reiterate, for those students who are committed to the project, "Unlike traditional research, action research produces knowledge grounded in local realities that is also useful to local participants" (p.98). For researchers working with marginalized populations whose ideologies are grounded in constructivism and social reconstructivism, PAR is a more ethical approach (Sandoval, 2000; Schiro, 2008; Smith, 2012**)**. Furthermore, YPAR draws on the notion of construction new knowledge. This study, to quote Dewey, is "a short step to the notion of taking the professional experience of teachers and other practitioners and using it as a source of knowledge about teaching" (Herr & Anderson, 2005, p.18).

Positionality of the researcher. As a white practitioner researcher in a position of power, this dissertation study will focus on the outcomes of actions initiated in the school setting rather than the my own practice. This distinction allows for the study of a particular case, the Senior Thesis YPEAR Project, and will therefore rely on a more traditional qualitative case study method of data collecting. However, it is imperative to note that as an insider, the researcher is a founding member of the school and is thus committed to the success of the site the research is taking place at. Furthermore, although not a direct advisor for any of the students participating in the study, it is still believed by the researcher that the moral, ethical and philosophical priority focus on the success of the student. Therefore, mechanisms for blending action research measures to address bias will be used to assure trustworthiness (Anderson & Herr, 2005).

As outlined above, the researcher bias is presented by reflecting upon my own subjectivity as being a part of the research location's staff. I also offered opportunities to

member check by allowing both the students and staff to read their interview transcripts to make sure they are represented accurately.

When considering insider/outsider positioning, there are several blurred definitions. Anderson & Herr (2005) provide a table that explores the continuum and implications of positionality of researchers in action research. In this study, the researcher would be considered an insider as the research will be done in their own setting. The research would contribute to the knowledge base and improved/critiqued practice.

However, when considering privilege, it is a bit challenging to figure out what the practitioner researcher would be in relation to Bank's (2008) categorization of researchers. As a white teacher raised and educated in suburban schools, the practitioner is paid to be a part of the school community. Therefore, it would seem that they should be categorized as an external-outsider. However, from a school community perspective, the small urban school with a democratic learning community and constructivist approach makes way for a stronger relationship between all. Consequently, the external-insider category seems like a better fit for this case:

> This individual was socialized within another culture and acquires its beliefs, values, behaviors, attitudes and knowledge. However, because of his or her unique experiences, the individual rejects many of the values, beliefs, and knowledge claims within his or her indigenous community and endorses those of the studied community. The external-insider is viewed by the new community as an "adopted" insider.—Banks, 1998, p.8.

According to Stringer (2007), the researcher must establish a stance that not threatening yet perceived as legitimate as perceived by all stakeholder groups. He warns, "Problems will soon emerge if the researcher is perceived as a stranger prying into people's affairs for little apparent reason or as an authority attempting to impose an

agenda," (p. 47). Having an insider perspective will allow for this to occur, and reduce the chances of problems emerging due to lack of trust. Additional reflections on my role in this research are offered throughout this chapter.

Information gathering techniques and selection of methodological tools. Bachor (2002) believes that an exemplar case study must present the most relevant evidence, including, "how the investigation was conducted and how collected evidence was handled and interpreted" (p. 21). Therefore, this study followed Yin's (1994) four principles of data collection by: Using multiples sources, addressing concern with data from electronic sources, creating a case study database, and maintaining a chain of evidence.

Yin (1994) posits "a major strength of case study data collection is the opportunity to use many different sources of evidence" (p. 119). With this in mind, this study includes multiple data collection sources including student and alumni interviews, student and staff discussion groups, and a records review of curricular frameworks. This helped provide an in-depth, thick description for the following chapters with a goal to draws the reader in (Glesne, 2011).

Although I analyzed this data through description of the case and themes of the case, measures were taken to collect data through various people. In particular, both current student and alumni interviews were conducted by a staff member who was not an advisor, and therefore did not share administrative duties or assign credit. Additionally, small group discussions involving two seniors and two staff were recorded without an interviewer present. Hopefully, these measures addressed some of the power issues related to being a research practitioner.

In an attempt to gain saturation of information, as much data as possible was collected. Student and alumni interviews and senior/staff discussions were the primary data sources. Ten seniors and ten staff were split into five small groups of four for the discussions, seven senior mid-year interviews and seven alumni exit interviews were transcribed verbatim. To add depth to the research, a records review of documents was used to supplement these findings. Instruments used to collect this data included: the researcher as observer, interview questions, and documents. When considering the methodological tools, three of Yin's (1994) six sources of evidence were used in this study: interviews, archival records and documentation.

A table follows detailing who was responsible for collecting the various data sources.

Participant	Data Source	Data collector	Completion date	Type of Data
Document Analysis	Vision and mission, advisory sustainability themes, yearlong workshop unit plans, Senior Thesis YPEAR curriculum, and rubric	Joey Zocher	September, 2014	Analyze these data, use the analytic framework noted in the Venn
Senior and Staff	Audio Taped discussion among students and staff while viewing video archive of alumni presentation and the alumni and current Senior Thesis YPEAR posters.	Audio recording of teams of current seniors, advisors and support staff discussions.	December, 2014	Rubric scores and discussion of past senior projects, and current senior posters from advisors, staff, and current senior students.
Senior	One-on-one interviews after their poster presentation	Emma as interviewer (Volunteer and Events Coordinator)	February, 2015	Reflection of semester progress of senior thesis
Alumni	Senior exit interview	Emma as interviewer (Volunteer and Events Coordinator)	June, 2014	Reflection immediately following completion of YPEAR project. Geared towards advice for future seniors.

Table 3.1: *Data Collection Table.* This table displays the data sources, data collectors, dates of data collection and the type of data used in this research study.

Common in qualitative research, the primary information source for this research was student interviews. Both the alumni exit interviews and the senior mid-year interviews lasted approximately fifteen minutes. These interviews were audio recorded and transcribed verbatim by the researcher. The student and staff discussions lasted approximately one hour. All interviewed participants had the opportunity to read their transcriptions to provide feedback to make sure their ideas were accurately expressed.

The instruments used to collect this data include: the researcher as interviewer, student interview questions, and alumni exit interview questions. All interviews were held in a private room at the school, the staff and student conversations were held off site at a university field station. Pseudonyms were assigned to all participants.

Yin (1994) believes that interviews have two key strengths, both of which offer great advantages to this study. First, interviews are targeted, and focus directly on the case study topics. Second, interviews are "insightful and provide explanations as well as personal views (e.g. perceptions, attitudes and meanings)" (p. 106). The interviews from the two major stakeholder groups in this study provided the primary data for this study. However, because participation in the study was voluntary, the risk of only having access to participants who enjoyed their experiences with the YPEAR senior thesis project(s) may have been masked. All alumni exit interviews were included, including those who scored between the 50-60 percent range, which is the minimum requirement to graduate.

Additionally, because there was a relationship between the interviewer and participants, response bias may be high due to reflexivity, where the, "interviewee gives what the interviewer wants to hear" (p. 106). Ideally, by having a staff member who was not an advisor lead the interviews, this bias was less severe. However, as a leader of the

school, there may still have been a desire to please that influenced answers. As the data was analyzed, I paid particular attention to contrasting responses with hopes to minimize this bias. Finally, these interviews run the risk of additional bias "due to poorly articulated questions," a risk considerably higher due to my novice nature as a researcher (Yin, 1994, p. 106).

In this study, any senior who was interested who had presented their YPEAR poster at a public presentation night was included in the mid-year senior review interviews. At the time, thirteen out of fourteen students qualified and seven students agreed to have their interview recorded to be included in the study.

The eight question student interviews took place in a private, small studio with the school's community outreach coordinator, Emma. Emma was selected to conduct the senior mid-year review and the alumni exit interview questions for this study for several reasons. First, Emma worked closely with students on their projects, so there was as comfortable, trusting working relationship. Second, although white, Emma's age was much closer to the students than the researcher, providing the potential for more honest feedback. Finally, because Emma did not have the authority to assign any credits or determine if students could graduate, students' felt less pressure to say the right thing. Combined, using Emma as the interviewer led to more trustworthy results than if I would have conducted the interviews myself.

The purpose of the eight question interviews was to talk about ways in which the students' were engaged in their senior thesis project: How they came up with the idea, how they thought it was going, and what they thought could be changed. The length of the interviews ranged from seven to fifteen minutes,

Data collection also took place during the annual four day long retreat took place at a UW-Stevens Point field station location in Tomahawk, WI. There were several objectives for seniors on this retreat. First, it provided an opportunity for seniors to bond in a place that was four hours north of their homes. Second, it provided them with field experiences in the north woods of WI during the winter months, an experience most students had never had. Finally, it provided them the opportunities to plan and reflect on their own projects, as well as opportunities to join the staff to reflect and change strategic aspects of the school in the future. The data collected for this study came recordings of five small group discussions related to the senior thesis YPEAR projects.

The objective of this annual discussion was to spend time in a small group practicing using the senior thesis rubric to assess former and current projects. The group of two staff and two students assessed an alumni's poster first, and then assessed the two current students' projects. Throughout this process, the group discussed what scores they would give for each category, how the scores could have been improved, and provided feedback on how the rubric itself could be changed. These conversations were transcribed verbatim and staff, student and interactions were coded as part of this study.

All graduating seniors were asked to complete an exit interview before they graduated, but it was not a graduation requirement. In 2014, there were ten graduates and seven exit interviews, all of which are included in this study. The purpose of the exit interviews was to reflect on the senior thesis YPEAR process, provide feedback to the staff about what they can do better and offer advice to incoming students as they begin to think about their senior thesis YPEAR projects. Just as the senior mid-year interviews,

Emma proctored these interviews in the small, private studio in the school. The interviews were recorded for staff, and were transcribed for this study.

One ethical consideration this project attempted to address is the innate power dynamics of the interview process during the information gathering stage. Kvale and Brinkmann (2009) point out that although the interviewee wants open and free dialogue, the nature of the interview itself sets up unequal power dynamics. To address this, they suggest a more collaborative approach to the interview, where the participant is involved in questioning, interpreting, and reporting. With this in mind, the interviews were all treated as semi-structured and staff and student discussions were included in lieu of a typical interview or focus group. Alumni exit interviews from the previous school year that lasted approximately fifteen minutes were transcribed verbatim. Additionally, participants had opportunities to interpret data and review the final report for additional insight.

Yin (1994) discusses several strengths to using archival records in case study research, including precision, stability, and unobtrusiveness. He also believes they can offer a broad range of data, and, "can cover a long span of time, many events, and many settings" (p. 106). This was the case for the archived records that were used in this study, as they provided opportunities to gather information from past senior experiences while they happened. One weakness that Yin (1994) expresses is that archival records may be difficult to access due to privacy reasons. In this study, the videos were open to all staff and to the public upon request, and were created with the intent to share information with future students, staff and interested community members.

Finally, information collected through a records review, what Yin (1994) calls documentation, was utilized to add depth to the research. The documentation for the records review includes EV's vision and mission, advisory sustainability themes, yearlong workshop unit plans, and the Senior Thesis YPEAR curriculum. Two of the weaknesses posed by Yin (1994), irretrievability and access, did not present a problem with these documents. All curriculum developed at the school is Open Source, and accessible to anyone who asks.

Another methodological tool used to gather information follows Yin's (1994) principle to create a case study database to organize and document collected data. This database was created using the computer software program NVivo. There were two separate collections: The data or evidentiary base and the researcher's report, in this study the research report is in the form of field notes, memos and oral form. As he suggests, "The use of computer files makes the distinction between these two collections even clearer" (p. 123). Indeed, this program allowed for clear organization and availability while analyzing the data.

Specifically, "The needed case study database will be a separate and orderly compilation of all the data from a case study" (p. 123). The database for this study includes three main categories: field notes, case study documents and new narrative compilations. As Merriam (1998) reiterates, "The researcher is the primary instrument of data collection and analysis" (p. 42). With this in mind, a variety of notes resulting from interviews, archival records or document analysis were created to help gather as much information as possible. These notes were organized according to the data source

they were inspired by and include scanned hand written notes and transcription of oral notes using the computer software program Dragon Dictate.

Another category in the case study database is dedicated to the case study documents. These include any recordings of interviews, transcriptions of interviews, electronic documents and archival documents. Any documents that were too large or in a non-electronic format were converted to portable document formats (PDF) to store electronically.

The last category in Yin's (1994) suggested database is designated for new narrative compilations. This type of narrative material would "compile the evidence dealing with particular themes or ideas that might have caught your attention during or just after data collections. The compilations would help you to sort your evidence more methodically to determine the strength of the empirical support for these themes and ideas" (p. 126). Weekly memos were written and stored here to keep ideas fresh and well documented.

This well organized database also helped address Yin's (1994) final recommended principle for data collection: to maintain a chain of evidence. "This principle is to allow an external observer—in this situation, the reader of the case study—to follow the derivation of any evidence from initial research questions to ultimate case study conclusions" (p. 127). In order to accomplish this, it was important to adequately cite all relevant sources in the final report. Additionally, these sources all contain actual evidence. Attention was given to specific details in methods to include the circumstances when evidence was collected to be sure everything is in order. Finally, the methods for

data collection all match the case study protocol. This also helps establish trustworthiness and credibility in the research process.

Selection of participants. For this curriculum-related research study, students and staff were identified as the principal stakeholders. Although other significant stakeholders include parents and community members, the information gathered from the YPEAR senior thesis projects will primarily affect the lives of students and staff in relation to the local school context. Therefore, alumni who completed the YPEAR senior thesis projects, current seniors and current staff were given the opportunity to participate in this study.

A meeting to discuss the study was held with interested students during the senior thesis workshops during the second month of school. Participation in the study was voluntary, however students may have felt obligated to participate to please me. Before any interviews or documents were collected, informed consent was obtained by all participants and their parents, if they were under 18 years of age. Participants brought consent documents home to their parents and brought them back signed. A letter and consent form was also sent home to parents. Parents had the opportunity to discuss the study with me at any time, and two staff members volunteered to help translate the discussion with parents who were dominant Spanish speakers. Consent documents were clearly written and were available in both English and Spanish.

The study was introduced to staff during a weekly staff meeting in September. During this time, staff had the opportunity to ask questions and decide if they wanted to participate. Although an advisor at the school, I am part of a six person collective and am not the direct supervisor of any of the advisors in the school.

Participation was by choice, and no deception or incomplete disclosure was used to recruit participants. The maximum number of alumni who completed the YPEAR project from the 2013-2014 school year was eight, however only seven students completed their exit interview. All seven interviews were transcribed verbatim and included in the study. The maximum number of seniors engaged in the senior thesis YPEAR project was fifteen, ten of which participated in the senior and staff discussion and seven participated in the mid-year interview. The maximum number of staff was ten, and all ten participated in the discussion.

As previously stated, the only criteria for students was that they participated in the YPEAR project. The screening process involved a conversation with the participants to make sure they were clear that participation in the study was voluntary. All qualified participants who wanted to participate were included, as long as consent from parents for students who were minors were completed. This group represented students and staff who were excited and actively engaged with their projects as well as those who were simply going through the motions in order to graduate or as a job expectation.

Although all students who volunteered to participate were included in this study, there was a diverse representation of socio-economic and ethnic populations. Additionally, the sample participant demographics were very similar to the school's student population, which were: one hundred percent urban, eighty-nine percent free or reduced lunch, seventy-nine percent Latina/o, ten percent African-American, ten percent White, and five percent American Indian. Another interesting demographic that helps tell the story of the participants was that forty-seven percent were bilingual and fifty-three percent were monolingual.

There was one interview per student, and all interviews were held in a private room at school. This location was selected because it was a safe and comfortable place for most of the participants. Additionally, it was a convenient location that everyone had access to. The interviews were also held in a private room so that participants felt they could be honest and their responses could be confidential.

Individual participants benefited by being able to share their voice, which also benefits society as they shared from a marginalized perspective of urban youth. By creating a school culture that encourages students to question authority, hopefully students felt like this was an opportunity rather than another requirement. Society also benefits by gaining knowledge about ecopedagogy in practice. This in turn will benefit urban educators interested in Education for Sustainability and transformative education. This research will be useful for policy makers and educators, who seek new avenues to make environmental education relevant to urban youth.

Description, analysis and interpretation of the generated data. The primary goal of this research study is to provide an empathetic understanding of how participants experienced and interpreted their senior thesis Youth Participatory Ecojustice Action Research (YPEAR) project, followed by a brief analysis of how this process affects their development of environmental literacy. Rather than focusing on the sum effect, this data represents the progression through which students move through the curriculum. In an attempt to gain saturation of information, twenty-two sources of data were included in this study including: seven alumni interviews, seven senior mid-year interviews, five senior and staff discussions and three documents. These sources included a total of twenty-nine participants: twelve seniors, seven alumni and ten staff.

Wolcott (1994) believes "the real mystique of qualitative inquiry lies in the process of *using* data rather than in the process of *gathering* data" (p.1). Yet with the substantial quantity of data collected, using the data could have been overwhelming. To help manage the data, Wolcott (1994) recommends three ways of organizing and reporting data through his description, analysis, and interpretation formula, or the D-A-I formula. Wolcott (1994) believes "Qualitative researchers need to be storytellers" (p. 17), and the first component of this framework focuses on describing the story. Specifically, the description section, "addresses the question, 'What is going on here?' Data consist of observations made by the researcher and/or reported to the researcher by others" (p. 12). Simply put, this section allows the data to "speak for themselves" (p. 10).

After reviewing the curriculum documents and the transcribed student mid-year interviews, alumni exit interviews and student and staff discussions, the data was coded into categories. In an attempt to keep the data as true to the voice of the students and staff as possible, an emphasis was placed on extensive initial codes. Using NVivo, fifty-four initial codes were created, and then sorted into sub-codes, codes and themes. Specifically, a total of 127 quotations were coded into twenty-four sub-codes and thirty-seven codes. After critical reflection on the initial codes and larger blocks of texts, ten themes were discovered. These themes were then used as a foil from which to understand how the notions of ecopedagogy, empowerment and transformation became manifest in the school's curriculum, students' YPEAR project, and ultimately supported students' development of environmental literacy.

The notion of ecopedagogy focused heavily on the curricular philosophy and model practiced at the school. It represented the least amount of direct quotes from the

participants, but the largest quantity of data collected from the document analysis.

Ecopedagogy Codes

Theme: Eco-Justice and Planetary Citizenship
Codes
• Sustainability
• Care for the Earth
• Empathy
Theme: Relationships
Codes
• Participatory dialogue
• Positive
Sub-codes
○ Care
○ Trust
○ Humor
• With the Earth
Theme: Critical Theory
Codes
• Dominant Discourse
• Social Justice
• Culturally Relevant Pedagogy
Theme: Curricular Ideologies
Codes
• Student-centered Learning
• Time to Figure it Out
• Community-Based Learning
• Service Learning
• YPAR

Table 3.2: *Sub-codes, Codes and Themes under Ecopedagogy.* This table represents the sub-codes and codes that overlapped to create rich themes. Through critical analysis, these four themes were selected to reflect the notion of ecopedagogy for this study.

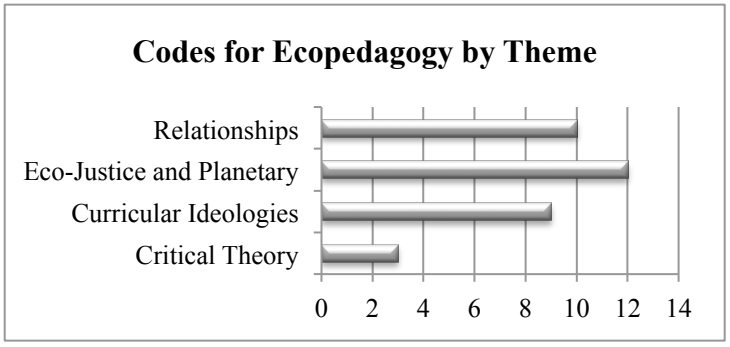

Figure 3.1: *Codes for Ecopedagogy by Theme.* This figure depicts the number of quotations that were coded by the four themes that have been categorized under ecopedagogy.

Empowerment Codes

Theme: Student-Centered Learning
Codes
• Interest
• Meaning
• Project Topic Choice
Sub-codes
○ Student Selected
○ Adult Selected
Theme: Power Dynamics
Codes
• Student Talking
• Adult Talking
• Locus of Control
Sub-codes
○ Lack of Control; Blaming Others
○ Owning Responsibility
Theme: Resiliency
Codes
• Change in Self-perception
• Change of Awareness
• Participation
• Thoughtfulness
Sub-codes
○ Asking others for their opinions

Table 3.3: *Sub-codes, Codes and Themes under Empowerment.* This table represents the sub-codes and codes that overlapped to create rich themes. Through critical analysis, these three themes were selected to reflect the notion of empowerment for this study.

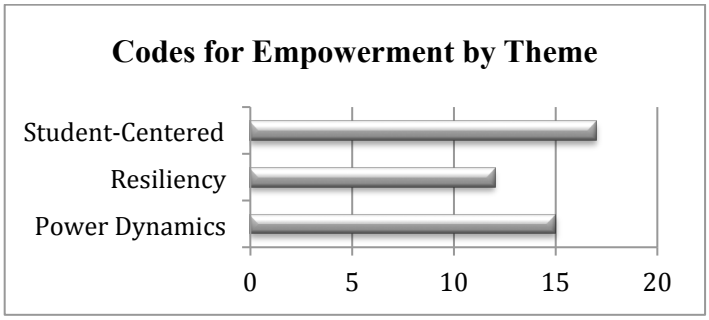

Figure 3.2: *Codes for Empowerment by Theme.* This figure depicts the number of quotations that were coded by the three themes that have been categorized under empowerment.

Transformation Codes

Theme: Critical Reflection
Codes
• Disorienting Dilemma
• Value of School
Sub-codes
o Mandatory: Goal of graduation
o Prepared for future
• Relationship with Peers
Sub-codes
o Competitive
o Collaborative
• Relationship with Community
Sub-codes
o Community can help participant
o Participant can help community
• Relationship with Earth
Sub-codes
o Resources to Manage and Use
o Interconnected; Value beyond Human Consumption
Theme: New Meaning Schemes
Codes
• Attitude
Sub-codes
o Positive
o Negative
• Knowledge and Understanding
Sub-codes
o Increased understanding
o Decreased understanding
• Skills
Sub-codes
o Increased skills
o Decreased skills
Theme: Activism
Codes
• Took Action for Change
• Spoke Up/Intervened when an issue appeared to be unjust
• Created Change in the Community
• Reason for Completing the Project
Sub-codes
o Change the community; Address a need
o Graduation requirement

Table 3.4: *Sub-codes, Codes and Themes under Transformation.* This table represents the sub-codes and codes that overlapped to create rich themes. Through critical analysis, these three themes were selected to reflect the notion of transformation for this study.

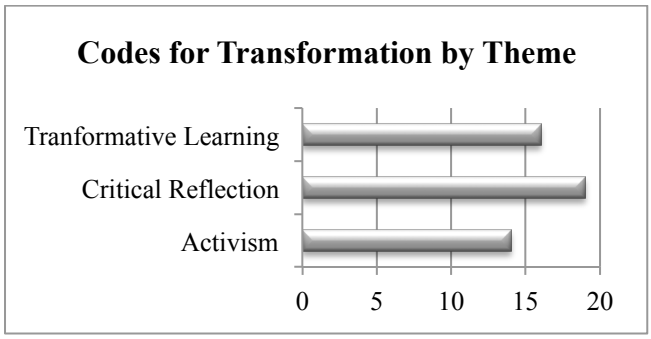

Figure 3.3: *Codes for Transformation by Theme.* This figure depicts the number of quotations that were coded by the three themes that have been categorized under transformation.

Larger blocks of texts were used to discover rich themes, and these themes were subsequently used to explore the notions of ecopedagogy, empowerment and transformation. To begin, thirty-four quotations fell under the ecopedagogy category: three sub-codes, fourteen codes, and four themes. In order to keep the pattern of three throughout the research, curricular ideologies and critical theory were clumped together into one theme. Next, forty-four quotations fell under the empowerment category: five sub-codes, eleven codes, and four themes. Finally, forty-nine quotations fell under the transformation category: sixteen sub-codes, twelve codes and three themes. The figure below depicts the percentage of text found in these three categories.

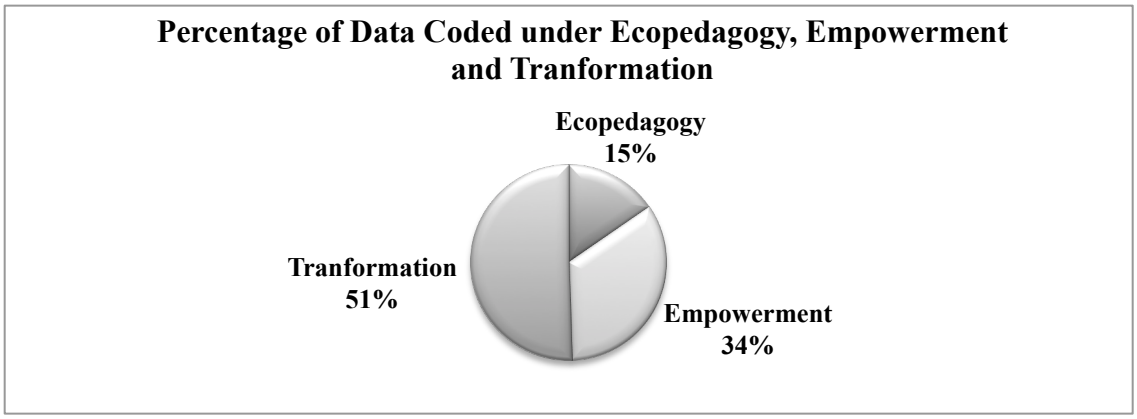

Figure 3.4: *Percentage of Data Coded under Ecopedagogy, Empowerment and Transformation.* This figure depicts the number of quotations that were coded under the three notions of ecopedagogy, empowerment and transformation.

Through Wolcott's (1994) rich description, the data speak for themselves by drawing on long excerpts of participants' words so that "informants themselves seem to tell their stories" (p. 10). A conscious effort was made to pull important codes from all types of data, and particular attention was paid to results and interactions I was not anticipating in an attempt to triangulate my findings.

The analysis section in Wolcott's (1994) framework, "Addresses the identification of essential features and the systemic description of interrelationships among them—in short, how things work" (p. 12). Following the description section, this section focuses on organizing and reporting data to "expand and extend beyond a purely descriptive account with an analysis that proceeds in some careful, systematic way to identify key factors and relationships among them" (p. 10). This section will begins with a creative display of the findings, and is followed-up by a process-oriented analysis.

Wolcott's (1994) interpretation section, "addresses processual questions of meanings and contexts: "How does it all mean?" "What is to be made of it all?" (p. 12). This section follows the analysis section for each theme and includes inferences related to environmental literacy and a personal connection with a goal to, "make sense of what is going on, to reach out for understanding or explanation beyond the limits of what can be explained with the degree of certainty usually associated with analysis" (p. 10-11). For this study, inferences and inductive reasoning with references to ecopedagogical theory within the broader scheme of the qualitative case study research approach were explored. Through critical analysis of student and alumni interviews, senior and staff discussions and documents, the emerging themes will be explored and analyzed through the lens of environmental literacy.

For the purpose of this study, an environmentally literate person is someone who can admit that our current cultural norms are not in concert with the natural world. Beyond this, they have developed a critical human consciousness and have identified themselves as an oppressor of the Earth. The individual who has embraced this is now ready to actively engage in working for more just, peaceful, and sustainable planetary community in order to liberate and decolonize the Earth. Rather than through competition, this individual's work is grounded in collective discourse through dignified interactions from multiple perspectives.

Specific outcomes to measure environmental literacy for the learning community were compiled from several sources. The following knowledge, skills and dispositions are derived from the framework for environmental literacy NAAEE suggested to PISA (*PISA*), Escuela Verde's vision and mission (*EV*), and Antunes & Gadotti's (2005) suggestion of ecopedagogy for the Earth Charter (*EC*).

EV provides opportunities to gain knowledge of and work with:

- Physical and ecological systems *(PISA)*
- Environmental issues *(PISA)*
- Sociopolitical systems *(PISA)*
- Strategies for addressing environmental issues *(PISA)*
- Activities supporting healthy emotional and physical choices *(EV)*
- A strong sense of place *(EV)*
- Feelings *(EC)*
- Global perspective *(EC)*
- The Earth's identity as essential to the human condition *(EC)*

The EV learning community will practice skills including:

- Identifying environmental issues *(PISA)*
- Analyzing environmental issues *(PISA)*
- Evaluating potential solutions to environmental issues *(PISA)*
- Proposing and justifying actions to address environmental issues *(PISA)*
- Engaging in dignified interactions to flourish without harm *(EV)*
- Collaborating with the community *(EV)*
- Praxis-researching, taking action, reflecting, adjusting *(EV)*
- Defending simplicity, care, and peacefulness *(EC)*
- Supporting interdependence *(EC)*
- Shaping the planetary conscience *(EC)*

EV encourages reflection and provides opportunities to increase:

- Interests *(PISA)*
- Sensitivity *(PISA)*
- Locus of control *(PISA)*
- Responsibility *(PISA)*
- Intentions to act *(PISA)*
- Thoughtfulness *(EV)*
- Happiness *(EV)*
- Meaningfulness *(EV)*
- Understanding *(EC)*
- Caring *(EC)*
- Peacefulness *(EC)*

Whereas these environmental literacy outcomes are used during the analysis portion of the study, for the most part this study took Wolcott's (1994) advice for novice researchers to stay as descriptive as long as possible, and simply, "Tell the story. Then tell how that happened to be the way you told it," (p. 16). This D-A-I formula was also used when presenting the findings.

Presentation of the findings. The presentation of the findings are paramount to a quality case study. In order to remain organized and fluid with the study, several of Wolcott's (1994) suggestions for effective ways to present the descriptive, analytical and interpretive data were used. In honor of his penchant for threes, three appropriate possibilities were selected for each category.

Beginning with the descriptive data, three ways that fit the data were selected to present this study: Critical or key event, plot and characters and the "Rashoman Effect." To begin, the *critical or key event* allows for a way to present meaningful parts of the case. This approach acknowledges that even with extensive data collection, it will be impossible to tell the whole story. Wolcott (1994) believes, "One way to circumvent the problem of never being able to tell the whole story is to focus on only one or two aspects, creating a story-within-a-story in which the essence (but not the detail) of the whole is revealed or reflected in microcosm" (p. 19). Chapter four begins by exploring the curricular frameworks as critical events integrated into the prologue.

Another way the data is displayed in a descriptive fashion is through Wolcott's (1994) *plot and characters* approach. Whereas all the individual students are central to this study, it has proven effective to introduce the "main character" for each theme to put the "story into motion." For each theme, a main character was selected as example of the trend in responses. At that point, I assumed the role of narrator, and took "responsibility to ensure that the audience understands what is happening by guiding or "talking over" as the plot develops" (Wolcott, 1994, p. 20). Although the participants in the study were primarily selected through convenience sampling, as the group was easily available to me, the main characters were selected in a purposeful fashion. First, in an attempt to show the full process of the senior thesis YPEAR project, four alumni and five seniors were selected as main characters. Additionally, five female and four male students were selected to offer both perspectives in relation to this case. This was due in part as an attempt to average the significant achievement gap between girls and boys in high school sciences (Jones, 2000; Quinn, 2011). Finally, it could be argued that this was

a critical case sample, because the students involved know the phenomena of the senior thesis YPEAR project better than a typical person. Considering this, several verbatim quotations were included by each of the main characters in an attempt to provide rich data to complete the story.

Taken from Japanese director Akira Kurosawa's 1950 film that depicted several versions of the same event through different witnesses, Wolcott's (1994) *"Rashoman Effect"* believes this storytelling technique offers unique perspectives. "This is somewhat akin to the scientist's search for and systemic examination of rival hypothesis, except that in the science game a single hypothesis usually emerges as victor, while adherence to the Rashomon Effect may make alternative interpretations equally compelling" (p. 22). This approach also adds to the trustworthiness of the study by providing multiple perspectives, and opened up avenues to explore students who were transformed by the YPEAR senior thesis project versus those who are simply going through the motion. For each theme, two students in supporting roles, and one in opposition of the main character are provided.

Although the majority of the presentation of data focuses on the descriptive aspects, three strategies identified by Wolcott (1994) have proven effective in organizing and presenting the analysis section of this study. These strategies include: highlight your findings, display your findings and contextualize in a broader analytical framework. Similar to summarizing the data, Wolcott's (1994) *highlight your findings* presentation suggestion offers a succinct way to share the data analysis. He states, "No more story, just the facts, now organized in such a way as to reveal those underlying properties and structures and relationships that are the stuff of analysis" (p. 30). These highlights are

presented through a process-oriented perspective during the talk back session that focuses on personal connections at the end of chapter four.

Although this strategy is typical and easy to use, another approach that fits with this study is Wolcott's (1994) *display your findings.* "For the findings-oriented researcher, graphic presentation offers an alternative to prose not only for conveying information but for dramatizing or emphasizing particular aspects of the study" (p. 31). Tufte's (1990) *Envisioning Information* supports this strategy by exploring creative and effective ways information has been displayed, and was inspirational in the development of the final display concepts. Using the Center for Ecoliteracy's guiding principle, "Nature Is Our Teacher," the display of findings follows ideas for shifts in systems thinking and core ecological concepts.

One last presentation strategy that is appropriate and useful for this study is Wolcott's (1994) *contextualize in a broader analytical framework.* He believes this approach is, "Most often accomplished through informed references to some recognized body of theory in one's special field, or to its recognized classics, in the tradition of the literature review" (p. 34). In this case, the data is contextualized in the broader framework of critical theory.

As a novice researcher, I took Wolcott's (1994) suggestion to err on the side of too much description, too little interpretation. Needless to say, some interpretation of the data has been included in chapter five. Of Wolcott's (1994) suggestions, three ways to approach interpretation fit well with this research study. The first is what Wolcott (1994) calls *mark and then make the leap*. Whether using the term inference or inductive reasoning, this approach enters into the "world of uncertainty." "The idea of inductive

inference goes back to Baconian times, and researchers through the years have employed similar phrases to assure both themselves and others that they were "doing science" (p. 40). As science plays a major role in this study, making the leap through inference is an appropriate way to present the findings.

Additionally, with a strong emphasis on ecopedagogical theory, Wolcott's (1994) *turn to theory* approach is an excellent way to present this data. "For interpretation, theory provides a way to link our case studies, invariably of modest scope, with larger issues" (p. 43). As this study focuses on an attempt to put theory to action, presenting the results in this fashion is a logical fit.

Finally, Wolcott's (1994) suggestion to *connect with personal experience* is a conclusion for this case study. According to Wolcott (1994), this approach offers two interpretive options, to personalize the interpretation and to make the interpretation personal. As a research-practitioner, it is undeniable that entering into this research has affected my consciousness. I have reflected on the process throughout the study and documented through weekly memos and reflection. A number of these personal reflections are presented in chapter four, however the majority of the personal reflections are found in chapter six.

When considering the D-A-I ratio, Wolcott (1994) uses the N-P-K plant food analogy. Just as every plant thrives with different formulas of the three primary macronutrients, so will every qualitative study adjust with the D-A-I ratio. Considering the research question along with the novice researcher, this study has a much larger percentage on the description aspect. The suggested 40-15-5 combination that indicates a detailed description, followed by an analysis and some interpretation (p. 48).

Trustworthiness and Credibility in the Research Process

There are many dilemmas associated with bias of qualitative case study and action research that may influence trustworthiness and credibility with the research process. Demonstrating an utmost of respect for the school community, it is very important that the proposed findings will be credible, trustworthy and valid. As Glesne (2011) addresses, "…unequivocal advice on 'right' or 'wrong' ways to behave is difficult to provide. Rather, the issues raised here are meant to alert you to areas that need consideration and forethought," (p.163). To begin, as participation was voluntary, it is likely that students, staff or alumni who have strong feelings about the YPEAR projects were the ones to volunteer. Most likely, participants who did not enjoy the experience did not step forward.

Additionally, teacher as researcher methodologies also have unique bias. Having a close relationship with the participants may have lead to false interpretations. One way of preventing this was by providing opportunities for participants to member check the information. This was done by providing opportunities for students and staff to read their transcripts to make sure their ideas were accurately represented. Although there is an innate power dynamic between the participants and researcher, some researchers feel this bias is justified because research also supports the idea that students will be more open and honest when working with a researcher they have built a relationship with (Creswell, 2011; Herr & Anderson, 2005).

Considering this, the research processes was enacted in ways sensitive to the cultural values and protocols of research participants and the climate of the school. As a novice researcher, several guidelines described by Creswell and summarized by Glesne

(2011) were followed. First, prolonged engagement and persistent observation by spending extended time in the field has been spent to develop trust, learn the culture, and check out my hunches. Next, crystallization, or the use of multiple data-collection methods, multiple sources, multiple investigations, and/or multiple theoretical perspectives through the various sources listed above was used. Yin (1994) supports this by suggesting that, "developing convergent evidence, data triangulation helps to strengthen the construct validity of your case study" (p. 121). Finally, all findings were accessible by and useable for the participants and site of investigation (Creswell, 2011).

Moreover, it is not the goal of this research to provide an answer, or suggest a "correct" curriculum. MacDonald and Walker (1977) posit that, "at all levels of the system what people think they're doing, what they say they are doing, what they appear to others to be doing, and what in fact they are doing, may be sources of considerable discrepancy . . .Any research which threatens to reveal these discrepancies threatens to create dissonance, both personal and political" (p. 106). As a research practitioner, my bias is clear. However, adhering to a critical praxis has shifted my focus from seeking an answer to seeking a process that involves change. This allows me to willingly enter into the discourse. This willingness is also part of the definition of environmental literacy defined in chapter one, and therefore supports the notion that this research has not sought comfort or the answers.

Likewise, this research has not received funding for this study. MacDonald and Walker (1977) make the distinction that "educational case studies are usually financed by people who have, directly or indirectly, power over those studied and portrayed" (p. 187). Rather, I conducted this case study as a founder of the school, and therefore the power

dynamics remain internal. Furthermore, although completed as partial fulfillment of the requirements for the degree of Doctor of Philosophy in Urban Education, this research plays no part of furthering an academic agenda. The publish-or-perish mentality of academia makes publishable research part of a career tenure, and is therefore indirectly linked to financial gains (Gad-El-Hak, 2004). Because research is not an expectation of a high school teacher or administrator, this study has the ability to be a more honest reflection of the case, regardless of if the findings are deemed worthy enough to be published.

One final thought on trustworthiness is that this research is not intended to be replicated. It may, however, be transferable if people who are not part of the study make the judgment that it is similar enough to their own situation to make it work. These judgments would need to be built on trust people have that the research outcomes may be transferred to their own situation, and therefore steps will be taken to provide a detailed description of the context, activities and events for readers to use to judge transferability.

The question of rigor and bias is a common critique of case studies, however critical leaders in educational reform argue for trustworthiness. Anyon's (1980) work on the hidden curriculum is easily transferred to concepts of hidden research agendas. Considering much of the academic research is funding through corporations and educational agendas with outcomes in mind, pretending to be objective seems to be dishonest. Freire (2005) makes the argument that education is not neutral, and without intentional discussion of subjectivity, research supports the status quo. With this in mind, Apple (1995) encourages all people who have agency to use their power to add to the educational research pool.

Ethical Issues

Guba and Lincoln (1985) refer to a common concern of case study research as, "unusual problems of ethics. An unethical case writer could so select from among available data that virtually anything he wished could be illustrated" (p. 378). As Merriam (1998) believes the primary instrument of data collection and analysis is the researcher, and while this has its advantages, the "sensitivity and integrity of the investigator" can also be a limitation.

In this study, the researcher's primary sensitivity and integrity lies with the population being studied, and therefore the research itself will be secondary. Additionally, the lack of research experience as a doctoral student impacts the integrity of the investigation. One way to address this concern is to take advice from my doctoral committee to make sure the research I am collecting and presenting is trustworthy and credible.

Protection of human participants. This project has been approved through the IRB process and will take steps to maintain the rights and privacy of research participants. In order to protect the human participants in this study, measures have been taken to ensure the likelihood and seriousness physical, psychological, social, economic or legal risks from participating in this study are minimal. Because the majority of the data collected is work already completed by participants and participation is voluntary, the probability of harm or discomfort anticipated from this research is not greater than ordinarily encountered in the participants' life. Although I am both the researcher and advisor at the school, measures have been put in place to assure I am not the direct advisor of any of the students in the study. This includes the assigning of credit related to

the project. Additionally, staff who are fluent in Spanish will speak with Spanish-speaking parents to make sure all aspects of the research are understood before giving consent to participate.

The privacy and confidentiality of the participants' responses and data will be safeguarded in several ways. First, the interviews will be held in a private location at the school. These interviews will be recorded using an audio recorder and transcribed verbatim. Participant selected pseudonyms will be used in the transcriptions. These transcriptions will then be coded to remove any other identifying information. Next, recorded interviews, transcriptions and coded data will be stored on a desktop computer and file cabinet located in the researcher's locked home office. Electronic verbatim interview transcripts will be encrypted and stored on this non-networked home desktop computer with password protection. Any print outs of this information will be coded and stored in a locked file cabinet in my home office.

The documents reviewed are all public documents. The YPEAR posters are located in the school for students, staff, parents and public to review as examples of Senior Thesis projects. They were showcased at a public presentation night on June 19th, and this year's seniors will publicly showcase their posters after the first semester of the 2014-2015 school year. No security measures will be taken for these public historical documents themselves, however data collected from these documents will be stored on the non-networked desktop computer with password protection in my home office.

Only coded data will be used in any subsequent publications or presentations remove any other identifying information. Additionally, all data collected for this study will be disposed of three years after the study is completed. Every attempt to protect the

identity of the participants will be made and the research records will not be linkable to the participants.

Limitations of the Study

To begin, human inquiry is complex and always incomplete. And therefore this study has many limitations. As Banks (1998) points out, "Researchers should strive for objectivity even though it is an unattainable, idealized goal," (p.6). That being said, as an research-practioner, there was obvious bias going into this research proposal that needed constant awareness and attention in order to not to influence the results. For example, it was critical that others, including fellow practitioners and the doctoral committee, had the opportunity to check the data so that there was a truthfulness when complete.

Next, because this study is part of a doctoral dissertation, there was the pragmatic reality of time with this investigation. Ideally, the study would have followed the same cohorts of seniors participating in the YPEAR project from the beginning until the end of the year. Instead, it took data from current students at the beginning and mid year, and data from alumni who completed their project the previous year.

Another limitation is that not all of the stakeholders who could have been included were. Although all students who have participated in the YPEAR project and all staff were invited to participate, some were not interested in participating. Additionally, it was not be plausible to interview the participants for extended periods of time, which limited my ability to follow up on all of the relevant issues.

A common argument from quantitative researchers, bias is one of the biggest critiques of both PAR and case study research. Yin (1994) points out that, "The need to use multiple sources of evidence far exceeds that in other researcher methods," in order

to reduce this bias (p. 119). Although the methodological and analytical approaches will include intentional efforts at triangulation for multiple sources of information, the positionality of the research creates an unarguable bias. Although more time consuming, it is in these efforts that allows for trustworthiness of the study.

Finally, it will not be possible to deal with all the contingencies that may arise, especially considering what Herr & Anderson (2005) call the double burden of action research, the time commitment of being both a researcher and a practitioner. In addition to the extensive amount of time getting to know the case, the difficulty often lies with presenting research that is acceptable with the greater research community, leading to additional time needed to make sure the research is trustworthy. Although this often deters researchers, for those who are passionately engaged as part of their learning community, it is a natural fit.

Conclusion

In closing, in *Education and Power* (1995) Apple supports the research practitioner as a means to achieve transformative communities.

> The issue is not only theoretic, of course. How are we to know what non-reproductive activity is occurring *if we do not participate in it ourselves?* If we do have agency—as I have insisted throughout this book and as the activity of vast numbers of people in their productive labor documents—then transformation is possible (p. 160).

Certified educators in our secondary schools have agency. Educational researchers also have agency. Shifting the dual burden concept to an asset-based approach, practitioner researchers in the field of education have dual agency and are thus primed to take action for transformation. However, it is imperative to be transparent with our bias throughout the process in order to be as trustworthy as possible. In an attempt to

put ecopedagogical theory into action, I completed this study as a research practitioner with a bias toward student success, urban school success, and environmental literacy.

This information will be useful for policy makers and educators who are seeking new avenues to make education relevant to urban youth. If YPEAR affects urban high school students' environmental literacy, it may be a viable option in the school reform aspects taking place in urban areas around our country. This is significant as it addresses ways to make education relevant to urban youth, empowering them to create more sustainable communities. The ultimate goal of the next few chapters is to help the reader gain a better understanding of the case through vicarious experiences.

Chapter Four

Research Findings

Taking into account the definitions and supporting literature from the previous chapters, this research is grounded in the idea that we need to explore new critical pedagogical approaches to develop environmental literacy with urban youth. One school's attempt to reach this is through a curriculum that focuses on ecopedagogy, empowerment and transformation. Specifically, this research addresses the question: How does Youth Participatory Eco-Justice Action Research (YPEAR) affect the development of environmental literacy in urban high school students?

The presentation of the findings follows Wolcott's (1994) description, analysis, interpretation formula integrated into a "play" format. The chapter is split into four distinct sections: The prologue, the play, researcher's reflections and the talk back session. The prologue material comes from the document analysis, and provides a backstory of the curricular lenses and inputs relating to the senior thesis YPEAR project. Each of the curricular lenses is treated as a critical event and is highlighted in a succinct way.

The students' stories are presented in a play format to illustrate the research findings. The "play" is broken down into three main acts: Ecopedagogy, empowerment and transformation. Each act focuses on three themes under each notion, and each of these themes includes four different students' stories. This was inspired by Wolcott's (1995) suggestion of plot and characters, and incudes a "main character" to exemplify each of the themes. Three "supporting roles" follow each of the main characters. The

third supporting role represents a counter argument to the theme, reflecting Wolcott's (1995) "Rashoman Effect."

The researcher's reflection section at the end of each act provides a creative way to display the findings of the three main characters representing each of the themes. The first character and theme will use a double-helix model to represent the cyclical shift to systems thinking. The second two main characters are represented by one of the *Center for Ecoliteracy's* (2015) six "Core Ecological Concepts" commonly found in nature. As science plays a major role in this study, Wolcott's (1994) suggestion to make the leap through inference is also presented in these sections as environmental literacy is tied in.

Whereas the majority of the chapter focuses on the description aspect of analysis, the talk back session at the end of the chapter follows Wolcott's (1994) suggested approach to both personalize the interpretation and to make the interpretation personal. As a research-practitioner, this section provides the opportunity to explain a few ways this research has affected my consciousness.

Cast (in order of appearance)

Victoria……..	A Latina senior whose senior thesis YPEAR project was, "In what ways does creating an art and craft space in the school affect student stress levels?"
Justin……..	A Latino senior whose senior thesis YPEAR project was, "In what ways does education about segregation affect multicultural relationships?"
Isabella……..	A Latina Senior whose senior thesis YPEAR project was, "In what ways does Western societal norms affect students' perspective of self?"
Christopher…	A Latino Senior whose senior thesis YPEAR project was, "In what ways does having knowledge of and using renewable energy affect our environment and community?"

Mika…….. A female American-Indian senior whose senior thesis YPEAR project was, “In what way does providing opportunities for teens to learn about food, the environment, and community impacts affect their belief that they can create a healthy commons?”

Sebastian…… A Latino senior whose senior thesis YPEAR project was, “The effects of educational games on student learning and behavior.”

Emily……. A Latina alumna whose senior thesis YPEAR project was, “In what ways does Mexican/American cultural identity affect the influence for healthy living on the south side of Milwaukee?”

Lucas…….. A Latino senior whose senior thesis YPEAR project was, “In what ways does providing opportunities for students to express themselves through music affect their self-esteem and collaboration to become planetary citizens?”

Jennifer…..... A Latina senior whose senior thesis YPEAR project was, “In what ways does providing opportunities for youth to create, design, and personalize clothing affect their feelings of empowerment and self-confidence?”

Angel……..... A Latino alumnus whose senior thesis YPEAR project was, “In what ways can alternative forms of transportation like biking affect the well-being of neighborhoods and the environment?”

Demarco……. A male African-American alumnus whose senior thesis YPEAR project was, “The Effects of Technology Used in Field Research on Students' Perceptions of Science.”

Luis…… A Latino senior whose senior thesis YPEAR project was, “In what ways does having youth art shown in public space affect young people's self confidence?”

Khalil…… A male African-America alumnus whose senior thesis YPEAR project was, “How does modeling raptivism affect youth perspective of themselves in their community?”

Ashley…… A Latina alumna whose senior thesis YPEAR project was, “The Effects of Student Artwork Opportunities on Self-Expression and Confidence.”

Jacob……..... A male White alumnus whose senior thesis YPEAR project was, “The Effects of Bike Education on Number of Urban Youth Comfortable Biking.”

Anthony……. A Latino alumnus whose senior thesis YPEAR project was, "In what ways does learning and sharing basketball opportunities affect health, self-esteem, happiness and collaboration of urban youth?"

Mia……. A Latina senior whose senior thesis YPEAR project was, "What are the effects of circle keeping and positive blogging on gossip and toxic culture within schools?"

Mike……... A male White senior whose senior thesis YPEAR project was, "How does knowledge of technology affect student use of technology in projects?"

David……..... A Latino senior whose senior thesis YPEAR project was, "How does learning science in Spanish affect students' desire to learn and speak science-related content in Spanish?"

Prologue

The objective of the prologue is to understand how the notions of ecopedagogy, empowerment and transformation became manifest in the school's curriculum, students' YPEAR project, and ultimately supported students' development of environmental literacy. Three curricular lenses emerged from the critical document analysis of the school's mission and vision, strategic planning documents, advisory sustainability themes, ongoing yearlong workshops, and senior thesis YPEAR curricular documents:: Ecology, peace and justice. These curricular lenses are explored in relation to the notions of ecopedagogy, empowerment and transformation, respectively.

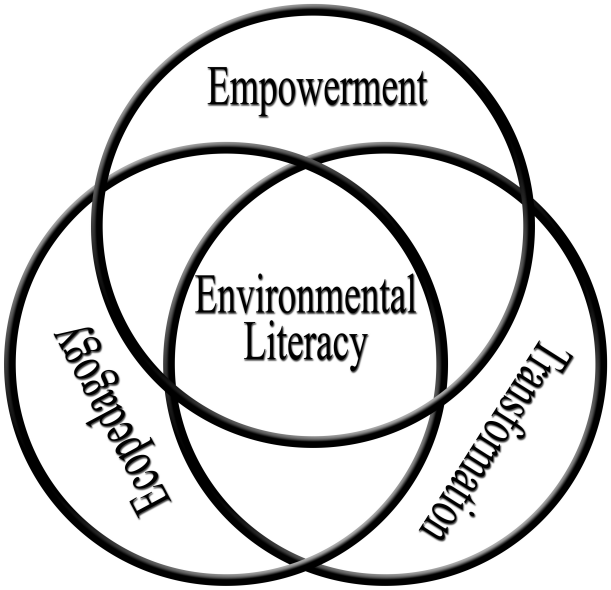

Figure 4.1: *Environmental Literacy Venn Diagram.* The concepts of empowerment, transformation and ecopedagogy overlap to affect the development of urban high school students' environmental literacy.

The YPEAR's Ecology Curricular Lens

The goal of Escuela Verde's ecological curricular lens is to focus the curriculum to help students become a part of the planetary citizenship. One way to accomplish this is through Environmental Education (EE). EE provides a platform to integrate traditional subjects together in a way that is meaningful and relevant to students. According to the Environmental Protection Agency (EPA), EE is a process that allows individuals to explore environmental issues, engage in problem solving, and take action to improve the environment. However, this process alone does not require individuals to think about the critical aspects of power in relation to environmental issues. Several examples of the ecological curricular lens in action can be seen in the table below.

Escuela Verde's Ecology Curricular Lens
Root: critical ecocentrism
Vision and Mission: EV's vision is to cultivate a community that is participatory, just, sustainable, and peaceful. This vision becomes manifest by: Engaging urban youth by adhering to an ecopedagogical praxis.
Advisory Sustainability Theme *Natural Laws & Ecological Principles* • Demonstrate awareness of the importance of a great diversity of life (biodiversity) to the long-term sustainability of humankind and other living species on Earth. • Explain how you are interdependent with others, all living things and natural systems.
Yearlong Workshop *Field Research Team* • *Objective:* Research the environment to create a more sustainable community with a focus on natural laws & ecological principles. • Science Credit
Senior Thesis YPEAR Rubric Category *Meaningful Community Service* Action and research addresses personally relevant issues, and student understands how their actions and research address the underlying social and eco-justice issues being addressed. The project is engaging and lead to attainable and visible outcomes that have significant impact on student and others in the school, local, and/or global community.

Table 4.1: *Escuela Verde's Ecology Curricular Lens.* This table provides several examples of how Escuela Verde's ecological curricular lens is manifested. These examples include the school's root ideologies, vision and mission, advisory sustainability themes, yearlong workshops and one of the senior thesis YPEAR rubric categories.

Escuela Verde's ecology lens appears to be rooted in critical ecocentrism, and this is manifested throughout the curriculum. With this in mind, it is important to recognize that the senior thesis YPEAR project alone is not responsible for the results found in this study, but rather the entire school climate, community and curriculum. In this case, the ecological curricular lens was woven into everything from the vision and mission of the school to the assessment rubric for the senior thesis YPEAR project. This process

certainly takes away from the student-centered ideologies, as there are required activities involving ecological issues.

However, this is where the blend of social reconstructivism came into play, as the staff believed in order to become environmentally literate, students must deconstruct harmful dominant norms and take action to build a new society that lives in harmony with each other and the Earth. This section explored several ways the inputs of the ecological curricular lens helped the ecopedagogical praxis become manifest.

The YPEAR's Peace Curricular Lens

Escuela Verde was grounded in the EdVisions project-based learning model, and adheres to many of the design essentials they recommend for a fundamentally different approach to teaching and learning. Adhering to a constructivist ideology is key component to the EdVisions model, however this process does not necessarily require students to consider the social and cultural environment if their school population is a monoculture. For example, the flagship EdVisions school, the Minnesota New Country School, is located in a tiny rural town with a predominantly white population. For these students and teachers, culturally-relevant curriculum is that of the dominant culture, so unless the curriculum intentionally works to address marginalized populations, there is a strong possibility that these topics won't even be considered.

In juxtaposition, urban schools have the benefit of diversity, leading to a blend of culturally relevant student projects. Additionally, adhering to a social reconstructivist ideology, the teacher collective at Escuela Verde proactively worked to address the tension they anticipated would build within the diverse cultural and socioeconomic student populations as they reflected and critiqued who they were in relation to society.

These negative feelings run the risk of being augmented as students begin to understand the role of the dominant Western culture's impact on the Earth. In so much, the data suggests Escuela Verde prioritizes a peace curricular lens, which is manifested throughout the curriculum. Several examples of the peace curricular lens in action can be seen in the table below.

Escuela Verde's Peace Curricular Lens
Root: critical constructivism
Vision and Mission: EV's vision is to cultivate a community that is participatory, just, sustainable, and peaceful. This vision becomes manifest by: Graduating reflective high school students prepared to live happy, healthy, meaningful lives.
Advisory Sustainability Theme *Empathy, Gratitude and Hope* • Imagine yourself in another's place and understand the other's feelings, desires, ideas, and actions, while feeling grateful for what you have. • Clearly define your goals, develop the specific strategies to reach those goals, and initiate and sustain the activities in support of those strategies.
Yearlong Workshop *Circle Keepers* • *Objective:* Learn peacekeeping strategies to create a more sustainable community Includes individual, school, community and global aspects of peace with a focus on empathy, gratitude and hope. • Wellness (Health) and Language Arts Credit
Senior Thesis YPEAR Rubric Category *Partnerships and Collaboration* A variety of partners are engaged. Partnerships engage in frequent and regular communication, establish a shared vision and set common goals, and collaboratively develop and implement action plans to meet specified goals. Partners share knowledge and understanding of school and community assets and needs, and view each other as valued resources.

Table 4.2: *Escuela Verde's Peace Curricular Lens.* This table provides several examples of how Escuela Verde's peace curricular lens is manifested. These examples include the school's root ideologies, vision and mission, advisory sustainability themes, yearlong workshops and one of the senior thesis YPEAR rubric categories.

In these examples, the peace curricular lens was woven into everything from the vision and mission of the school to the assessment rubric for the senior thesis YPEAR project.[1] This lens is an intentional proactive step to care for the staff and students as they enter into dominant discourse.

Through annual strategic planning sessions, the staff developed a logic model and vision and mission that believes students must deconstruct harmful dominant norms and take action to build a new society that lives in harmony with each other and the Earth in order to become environmentally literate. With this in mind, our marginalized urban youth need opportunities to practice taking action to work towards a just community.

The YPEAR's Justice Curricular Lens

The overall goal of creating environmentally literate citizens is to hope they will take action for change. However, even understanding power in relation to environmental issues and empowering people to take action for change does not always lead to taking action. One example of this is the number of privileged dominant white educators who have the knowledge of urban educational issues, the power to create change, but are not taking the action for curricular reform. Often the drawn conclusion is that dominant culture does not act to transform communities because they want to keep the power. In juxtaposition, Escuela Verde's justice curricular lens is rooted in social reconstructivism, and believes there are people who want to take action for change but need help developing the skills and have opportunities to practice doing so.

[1] Just as with the ecological lens, it is important to recognize that the senior thesis YPEAR project alone is not responsible for the results found in this study, but rather the entire school climate, community and curriculum.

This theory is put into action by providing transformative spaces where students can practice taking action to create change in issues that are important and relevant to their lives. Several examples of the justice curricular lens in action can be seen in the table below.

Escuela Verde's Justice Curricular Lens
Root: social reconstructivism
Vision and Mission: EV's vision is to cultivate a community that is participatory, just, sustainable, and peaceful. This vision becomes manifest by: Collaborating with the community to create a strong sense of place and skills to flourish without harm.
Advisory Sustainability Theme *Responsible Local & Global Citizenship* • Know and understand the rights, responsibilities, and actions associated with leadership and participation toward healthy and sustainable communities. • Take action by leading and/or participating in activities leading toward healthy and sustainable communities.
Yearlong Workshop *Youth Activists* • *Objective:* Take action to create a more just community with a focus on responsible local & global citizenship • Social Studies Credit
Senior Thesis YPEAR Rubric Category *Diversity and Justice* • Participants analyze different points of view to gain understanding of multiple perspectives, develop interpersonal skills in conflict resolution and decision-making, recognize and overcome stereotypes, and understand and value the diverse backgrounds and perspectives of those offering and receiving service. Decisions are made through a consensus process.

Table 4.3: *Escuela Verde's Justice Curricular Lens.* This table provides several examples of how Escuela Verde's justice curricular lens is manifested. These examples include the school's root ideologies, vision and mission, advisory sustainability themes, yearlong workshops and one of the senior thesis YPEAR rubric categories.

The school climate, community and curriculum at Escuela Verde is developed in part through a justice lens. In this example, the justice curricular lens was woven into

everything from the vision and mission of the school to the assessment rubric for the senior thesis YPEAR project. This lens appears to be an intentional proactive step to offer students and staff opportunities to practice taking action to create change in issues that are important and relevant to their lives. To illustrate how students take up three curricular lenses, I present the students' stories in the form of a play format through three main acts: Ecopedagogy, empowerment and transformation.

Act I: Ecopedagogy

As discussed in previous chapters, the theoretical framework used by this project is Freire's ecopedagogy. Through an ecopedagogical praxis manifest in the curriculum, teachers as well as learners examine systematically their own oppressor-oppressed roles as members of a particular unsustainable modern community/culture. This section describes, analyzes and interprets aspects related to how the school adheres to ecopedagogical praxis as an ideological approach in the curriculum and how it affects the students' development of environmental literacy. Three distinct themes related to ecopedagogy emerged through critical analysis of senior interviews, alumni exit interviews and senior and staff discussions: Critical theory and curricular ideologies, eco-justice and planetary citizenship and care and participatory dialogue.

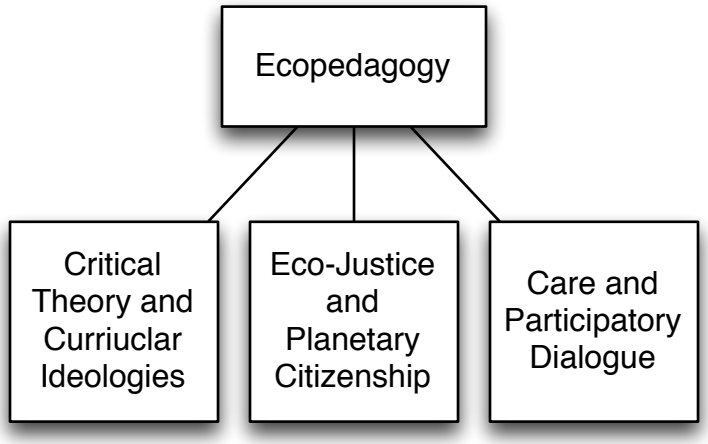

Figure 4.2: *Ecopedagogy Themes.* Multiple themes overlapped to operationalize ecopedagogy. These themes substantiate that adhering to ecopedagogical praxis affects the development of urban high school students' environmental literacy.

Scene I: Critical Theory and Curricular Ideologies

One of the key principles associated with embracing an ecopedagogical praxis for teaching in learning is that of critical theory. Grounded in Freire's (1970) critical pedagogy and incorporating what Schiro (2008) describes as student-centered and social reconstructivist curriculum ideologies, Escuela Verde is committed to a non-traditional approach to education. The school's democratic learning community is lead by a teacher collective, where advisors share teaching and administrative responsibilities. They also model ownership and demonstrate democratic leadership and encourage students, parents and community members to take ownership and actively engage in decision-making.

One opportunity for students to practice this style of leadership is through the senior thesis YPEAR project. The three most prevalent codes –social justice, confidence to enter into the dominant discourse and taking action to create positive change through service learning overlapped to create a rich theme of critical theory and curricular ideologies.

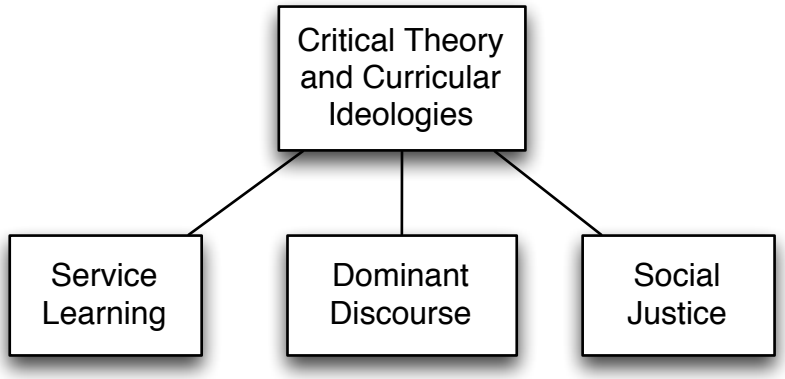

Figure 4.3: *Critical Theory and Curricular Ideologies Codes.* Multiple codes overlapped to develop a rich theme of critical theory and curricular ideologies, which substantiates that embracing critical theory affects the development of urban high school students' environmental literacy.

In this scene, Victoria shares the presence of these three prevalent codes.

Main character: Victoria. Victoria was a seventeen year-old female Latina student who was currently working on her senior thesis project titled, "In what ways does creating an art and craft space in the school affect student stress levels?" Victoria volunteered to be part of the study and participated in the mid-year senior thesis review. Her interview was short -- 7:13 minutes. This was due, in part, to her excitement and fast pace when answering the questions. When asked to tell Emma about her senior thesis project, Victoria replied, "My senior thesis is basically art therapy and how participating with art can actually decrease stress in students . . . and in the adults, too!"

Although a simple statement, Victoria used the phrase "participating *with* art" and made a point to acknowledge that her art therapy project can help decrease stress "in the adults, too." For her, this demonstrates that she moved beyond her passion for art itself to explore how it impacted the community as a whole. This related to the code of social justice where students and advisors collaboratively work for a fair distribution of

opportunities and access to what they need to be successful citizens. Another quote that substantiates this idea came from the mid-year interview, when Victoria stated,

> I really like the idea of art therapy, I really do! I've always found therapy very interesting and really like the idea but I hadn't spent much time exploring it and how it helps people. I almost thought about becoming a therapist but I like art more.

During the senior thesis YPEAR project, Victoria began to explore the broader impacts of art in the community. This demonstrates how her knowledge shifted from objective to contextual, as she explored ways that art activities could support healthy emotional choices for the school community and beyond. She spoke a bit about her older brother, who was struggling a little to find his path, and felt that she would be better off simply by knowing who she was.

> Art really is a passion of mine and I found out my true self, I mean, when I'm still in high school rather than, you know, a couple of six or seven years in the future where I still have no idea what I'm doing yet.

Although not as traditional as her peers, Victoria seemed confident, and even excited, to know who she was. This related to the code of dominant discourse, as she reflected on what she really wanted for her life. Although she mentioned a potential career path earlier in the conversation, she didn't see this as the primary goal of her senior thesis project. Rather, she felt that discovering her passion was what set her apart, which is a key aspect to the development of environmental literacy. Specifically, this point impacts the disposition outcomes presented to measure environmental literacy, and demonstrates that Victoria has reflected on what it will mean for her to be happy in her life.

The third code of service learning was substantiated by Victoria when she thought about the future of her project. When asked what her plans were for the second half of her project, Victoria responded with,

> I'm going to do some more research on art therapy and art in general and I think I'm going to branch out a little bit and try to think about, like, how schools are cutting art funds even though it's pretty good for them and kind maybe work on spreading the word for that little bit.

She further elaborated that she might like to do a public service announcement (PSA) with a fellow student who is working on video editing for his project. This related to the code of service learning where students were encouraged to take action to create positive change in their communities. This demonstrated how her development of environmental literacy was impacted by her practice skills defending simplicity, care, and peacefulness through art therapy.

Admittedly, Victoria's project does not present a typical view of eco-justice compared to other projects including topics such as renewable energy, alternative transportation and gardening. However, when considering the knowledge, skills and dispositions that are necessary for the development of critically environmentally literate people, it is important to acknowledge the art activities she shared that supported healthy emotional and physical choices for students and staff, the skills she acquired defending simplicity, care, and peacefulness and her overall disposition of happiness. The most prevalent codes in the theme of critical theory and curricular ideologies were substantiated by many of the students, including Justin, Isabella and Christopher.

Supporting roles: Justin, Isabella, and Christopher. Justin was a senior, male Latino student who was passionate about race relations in the city. He talked openly about how he was often mistaken as an African-American male, and felt that people

assumed he was violent because of this. He reflected on his own project, "In what ways does education about segregation affect multicultural relationships," and a past alumnus' project with another student and two staff members during an hour-long discussion at a senior and staff planning retreat.

During this discussion, Justin substantiated the code of social justice while discussing an alumnus' senior thesis project on the effects of positive hip hop music on urban youth. He began to think about how the graduate's music project related to his project about racism and segregation,

> Yeah and you know, like you think about it and we all talk about it . . . how racism is a huge issue right now and with segregation yet people the ones were complaining on it are still making music that is calling themselves that one word that they don't want to be called by any other race.

He continued this thought by giving an example of a particular artist's lyrics he was upset about who continuously used the "n-word",

> You know, like, he knows that he shouldn't be using it and he shouldn't be addressing himself like that, that way, but they do it and act like this is just the history of it we don't know where it came from but this is just how we use it because this is who we are. And yet we want to improve but the people who want to improve are still degrading their own races. Not only that race but there are other races that do that that do stuff that knocked them back.

Justin used words like "n-word" and "degrading" to emphasis that he understood the power of language has on oppression. For him, this means he is committed to help "improve" and support his cultural heritage by not using "degrading" words. This is significant because it demonstrates that he not only understands, but cares about social justice.

Isabella, was an eighteen-year old Latina student who was passionately connected to meditation, yoga and peacekeeping work shared her project ideas with students and

staff during the retreat as well. An active member of the Circle Keepers, a student group integral to the restorative justice process at the school, Isabella's senior thesis YPEAR project was, "In what ways does Western societal norms affect students' perspective of self?"

One quote that substantiated her willingness to enter into the dominant discourse came from a discussion about how U.S. schools put pressures on students to conform. She gave the example of how US schools treated American Indians at the turn of the century, with the goal of graduation to be,

> Like, now you're white now! But, like, that's what I'm just trying to kind a touch on with this project might help with Western civilization. We think that we're like the top dogs and everybody has to conform to what we're doing and we're not… like we're more like . . . I don't know, we're more confused than any other people.

Isabella used phrases like "top dogs" and "everybody has to conform" to emphasis that "Western civilization" is trying to dominate and colonize other cultures. However, her juxtaposing this with the phrase, "we're more confused than any other people," shows her willingness to enter into the dominant discourse. For her, this justified her senior thesis YPEAR actions, which included the design of a "Zen meditation" room for the school and practicing yoga. This is significant because it demonstrates the process of defending simplicity, care and peacefulness, one of Earth Charter's outcomes for environmental literacy.

However, the senior thesis YPEAR project did not have the same impact on all students as it did on Victoria, Justin and Isabella. Christopher, a senior Latino student, was a highly engaged student at the school He participated in many of the workshops, trips and clubs the school had to offer. He also talked about his senior thesis project, "In

what ways does having knowledge of and using renewable energy affect our environment and community?" He, however, drew a conclusion that was counter to the critical theory theme during his mid-year senior reflection, when contemplating why students stopped attending his workshop on renewable energy,

> I think when students want to learn something they usually learn from professionals who can teach it. So, Nick was a professional and he knew where everything was and how it worked and me as a student, you know, I wasn't professional, I mean I know how some of the things work but I guess they didn't . . . I don't know, I guess it is kind of just died down.

Christopher used phrases like "learned from professionals" and "knew how it worked" to emphasis that he was not qualified to teach. For him, this means that students stopped coming to his workshop because he was not qualified to teach. Whereas his project was designed to integrate renewable energy into the school, with an emphasis on using a hands-on energy bike, he never mentioned enjoying the project or students enjoying. Although in his second year at the school, when given the opportunity to run his own workshop, Christopher reverted back to his more traditional scholar-academic ideology.

This is related to the code of service learning, where it was evident he was not clear about any service beyond content knowledge he was providing to the students. This demonstrates how his knowledge of the senior thesis YPEAR project is stuck in the objective content areas, and he does not recognize the importance of any dispositions such as happiness. To him, the focus of education is still to gain content knowledge, and if students do not like it, it must be because they are not gaining the content knowledge they want. Although Christopher may not understand, the objectives of the YPEAR project do not focus on content but rather process and taking action for change. The next

scene focuses on the student responses related to the theme of eco-justice and planetary citizenship.

Scene II: Eco-Justice and Planetary Citizenship

Three codes emerged as the most commonly mentioned concepts throughout the data collection that address the theme of eco-justice and planetary citizenship: Care for the Earth, sustainability and empathy. Eco-justice and planetary citizenship is an integral part of ecopedagogy. According to Antunes and Gadotti (2005), learning to value and have dignified interactions and meaningful dialogue is critical to the next phase of 'planetary civilization.'

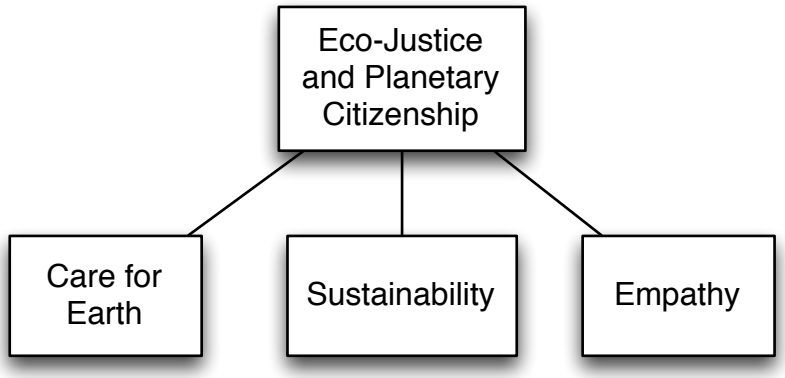

Figure 4.4: *Eco-Justice and Planetary Citizenship Codes.* Multiple codes overlapped to develop a rich theme of eco-justice and planetary citizenship, which substantiates that taking action towards eco-justice affects the development of urban high school students' environmental literacy.

Mika exemplified this theme.

Main character: Mika. Mika was an American Indian female senior with a passion for gardening and cooking. She was a passionate student in her second year at the school. Her senior thesis YPEAR project was, "In what way does providing opportunities for teens to learn about food, the environment, and community impacts affect their belief that they can create a healthy commons," and she worked on aspects of it for two years.

During her mid-year senior reflection interview, when she was asked, “Tell me about your senior thesis project,” she responded,

> My senior thesis deals with, like, youth healthy choices and it's kind of about like how your actions affect you and how they affect the Earth because everything is like all tied together.

Mika focused on how peoples actions affected them, in addition to how they “affect the Earth” to emphasis that everything is “tied together.” For her, this meant that she was thinking beyond her own needs, and that her project was trying to teach her peers to do the same. This is related to the code of empathy where Mika realized some of her past harmful actions were due to lack of knowledge and resources, and she wanted to share her knowledge and resources with her peers. This provided opportunities to increase student development of environmental literacy dispositions by encouraging reflection and building empathy with the Earth.

In an attempt to get as much depth as possible, the questions asked in the interview were very general. One specific probing question asked, “Can you tell me more about that?” Mika responded,

> With the green wall we did, like, explore how you can repurpose materials into a way to like get more sustainable food for yourself. That way it wouldn't cost you as much as if you went out and purchased every single thing you ate . . . which is also better for the environment because it's like one less thing you have to grow in a big farm and it's better for you because you can control what you're eating. That way and you don't have to put like pesticides or other kinds of chemicals on it.

Statements such as, “repurpose materials” and “sustainable food” demonstrated that Mika spent time researching multiple ways to be sustainable. She also talked about being in control of the pesticides and chemicals she ate. For her, this meant people would be healthier and independent. This is significant because it is related to the code of

sustainability, which was the focus of Mika's project. Since her project included the EV lunch bunch, a voluntary yearlong workshop, as well as service learners from UW-Milwaukee, it affected the development of environmental literacy in students by providing them with opportunities to gain knowledge of physical and ecological systems.

When asked, "Why are you doing this project?" Mika substantiated the theme of eco-justice and planetary citizenship by explaining that the she was worked with the lunch bunch to,

> Look at different ways students can reduce food waste, GMOs or other organisms like that, all different kinds of things but always in the same subject of food for personal betterment and bettering the Earth, too.

Mika felt that helping students take action related to food was important for "personal betterment" as well as "bettering the Earth, too." This is related to the code of care for the Earth where Mika felt the Earth needed to be healed. This affected the development of environmental literacy skills in the students she worked with by providing them with practice evaluating potential solutions to environmental issues such as waste, GMOs and chemical pollution.

Many of the students, including Justin, Sebastian and Emily also shared projects that included codes that addressed care for the Earth, sustainability and empathy, and supported the rich theme of eco-justice and planetary citizenship.

Supporting roles: Justin, Sebastian and Emily. One quote that substantiates this theme came from Justin during the discussion groups when reflecting on Khalil's project from the previous year. He talked about how eco-justice fit into a song he had a guest appearance on that was presented as part of Khalil's senior project,

> Not only that but if you look next to each song he has a sustainability theme – and if you listen to the song you can a see where it comes in. Like MC^2, the one with me, like (raps)
>
> > *Milwaukee MC's on the spot*
> > *Please leave if you're not dropping science like it's hot*
> > *'cause it is, and if you didn't know, your kids will*
> > *We're swapping knowledge with the toys in your kid meals.*
>
> That whole song we're talking about like changing the world, but not like, but like in a way that's like with wordplay.

Justin stated that they were talking about "changing the world" in what he called "wordplay," which to him means the lyrics of their Hip Hop song. This is related to the code of care for the Earth, where Khalil and Justin wrote Hip Hop music with lyrics that focused on sustainability. This is significant as it affected their development of environmental literacy skills by providing them with an opportunity to practice evaluating a potential solution to environmental issues.

Another quote that substantiates this theme came from Sebastian during his group discussion. Sebastian was a senior Latino in starting his first year at Escuela Verde. Although struggling to make the transition into the new teaching and learning style, he was excited and committed to working on his senior thesis titled, "The effects of educational games on student learning and behavior." When reviewing Emily's poster from the previous year, Sebastian used her survey results to determine her project,

> …was like a cooking class or demonstration where some of the students participated and she is saying like some people might get interested in learning how to cook for themselves, more healthier.

For Sebastian, Emily provided the knowledge and skills to help the students who participated "cook for themselves" and recognized that the recipes were "more healthier."

He felt that this helped students think about their choices, and gave Emily a score of 5 out of 8 on her rubric for ecojustice. This provided opportunities to increase student development of environmental literacy dispositions by encouraging reflection and building empathy with the Earth. Interestingly, Mika was in the same discussion and felt differently about Emily's score.

> Like for me, I could see here eco-justice theme because I know what I'm looking for, but she mentions it in the beginning and doesn't carry it throughout. It's just that it's really hard to figure out the eco-justice topic, like what specifically are you looking at with food justice, like is there food waste or is it there are no options for urban gardens available... you know, that's just one of the things I would have like to have seen.

Mika only gave Emily a 3 out of 8 for this category on her senior thesis rubric, because although Emily mentioned "food justice" on her poster, Mika wanted her to be more specific. She brought up the valid point that some students know they need to include eco-justice issues and just include them as an after thought, rather than making them an explicit focal point of the project. Mika used this discussion and realization to influence her own poster, and made sure that her eco-justice theme was explicit. She also felt empowered to disagree with Sebastian, knowing that it was okay for them to have different opinions, which leads us into the third scene: care and participatory dialogue.

Scene III: Care and Participatory Dialogue

Three codes—Trust, relationships and humor—emerged that address the theme of care and participatory dialogue. Care and participatory dialogue are also associated with ecopedagogy. Noddings' (1984) care theory is based on the idea that two parties *authentically* care for each other,

> I reject the notion that the formal study of history will make better citizens or policy makers who will not repeat the mistakes of the past. What children need to learn is how to sympathize and empathize with other people and to understand their own inclinations toward cruelty and violence (p. 55).

Likewise, Friere's (1970) problem-posing education offers an alternate, more constructivist approach to teaching and learning. One way to accomplish this is through participatory dialogue, in which students and staff interact as a team to make plans and rules for the school. As many of the urban youth in this study are from marginalized populations, this emphasis is aimed to create an equitable chance for both sides to control and balance situations in a way that is free from manipulation and coercion in the process.

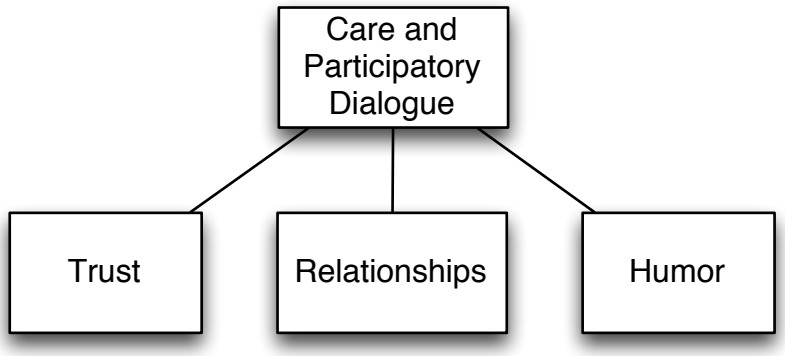

Figure 4.5: *Care and Participatory Dialogue Codes.* Multiple codes overlapped to develop a rich theme of care and participatory dialogue, which substantiates that carefully engaging in participatory dialogue affects the development of urban high school students' environmental literacy.

One student, Lucas, exemplified this theme.

Main character: Lucas. Lucas was an eighteen-year old bilingual senior who identified as an alternative rocker and was interested in Mexican immigration issues. He combined his two most visible identities to create his senior thesis YPEAR project titled, "In what ways does providing opportunities for students to express themselves through music affect their self-esteem and collaboration to become planetary citizens?" Lucas

started at EV his senior year, and thus his project evolved more than most from the beginning to mid-year. This evolution substantiated the theme of care and participatory dialogue, as the focus shifted from a global perspective to the more local school community as he formed relationships with his peers.

One quote that substantiates this theme came from his mid-year interview when he was asked what his project was about. "Well, it's basically about expressing yourself through music, and learning how to collaborate with other people and help them." Statements such as, "expressing yourself" and "learning how to collaborate" demonstrate that this student has really focused on empowering students to express themselves. For him, this means providing a space and time to allow students to collaborate together without adults. Lucas' songwriting workshop took place in the school's small recording studio. It started as a four-week wellness project, but continued throughout the year.

This is significant because it is related to the code of relationships where Lucas emphasizes the importance of collaboration. This affected the development of environmental literacy skills in students by providing them with practice collaborating with the community. Furthermore, these relationships and collaborative songwriting efforts substantiate the theme of care and participatory dialogue.

In an attempt to get as much depth as possible, the questions asked in the interview were very general. One specific question asked, "Why are you doing this project?"

> Well I started off with the songwriting workshop where students could you know, like, express themselves like they can help relieve themselves *(laughs)* and also help other people who are going through some issues.

Lucas used phrases like “relieve themselves” and “going through some issues” to emphasis that some students needed this outlet without adult presence during the day. For him, this meant he recognized that the songwriting process was not the main focus of the workshop any longer. His tone in the interview was far from disappointment or fear of being reprimanded, but rather had a playful feel that related to the code of humor. This affected their development of environmental literacy by providing them with opportunities to reflect and practice caring for each other.

A final quote that substantiates this theme came when Lucas was asked, “How is this experience different compared to your other school experiences?” His response was, “Mostly, like, we’re in an environment where they feel safe so, like, no one can judge you and stuff because we’re all, like, open-minded . . . so, yeah.” Lucas used words like “Safe” and “open-minded” to emphasis that the half-hour long workshop that took place during wellness was a sort of transformative space where students could work together to discuss their issues and express themselves in a safe environment.

This is related to the code of trust where Lucas felt that he was trusted to lead a workshop, and students trusted each other enough to not “judge.” This is significant because in this situation, the theme of care and participatory dialogue provided opportunities for students to increase their development of environmental literacy by working to understand and develop a strong sense of place.

This rich theme of care and participatory dialogue was also noted by many students, including Jennifer, Angel and Demarco.

Supporting roles: Jennifer, Angel, and Demarco. Jennifer was a Latina senior with a strong personality. Following in the footsteps of her older sister Ashley, Jennifer was

passionate about art and social justice. Her senior thesis YPEAR project, “In what ways does providing opportunities for youth to create, design, and personalize clothing affect their feelings of empowerment and self-confidence?” was grounded in much of her own struggles. Whereas she talked about her sister being gregarious and loved by all, Jennifer often came across as unapproachable and mean.

However, in her second year at the school she began to let her walls down and open up a little. She participated in both the discussion and the mid-year senior review, where the she commented, “all the advisors want to see the students succeed and they push them. Even when the student doesn't want to be pushed *(laughs)*.” Jennifer acknowledged that the advisors wanted to “see the students succeed” but that some students didn’t “want to be pushed.”

Her laughter in the interview means she is aware that she had been resistant to the “pushing,” but was grateful for it. This is significant because it is related to the code of humor, which substantiated the theme of care and participatory dialogue. Furthermore, it affected her development of environmental literacy by providing her with opportunity to reflect and practice care.

Another quote that substantiates this theme came from Angel during his senior exit interview. Angel was a Latino alumnus who completed his senior thesis YPEAR project in 2014 titled, “In what ways can alternative forms of transportation like biking affect the well-being of neighborhoods and the environment?” He was a bilingual learner who struggled with the academic aspects of school, but was a true kinesthetic learner. When asked how EV was different from his past schools, Angel replied,

> Well, EV was different than my other school. That school was really ghetto. I was really scared of going there, like, at times when I just started going there was just like, "I don't wanna be here." And here's different, it's like, I don't know, you feel more welcomed. It's like everyone's friendly with each other, they don't really cause problems, when at my other school there'd be fights, riots.

Angel's quote is related to the code of trust which substantiates the theme of care and participatory dialogue. This also provided opportunities for Angel to increase his development of environmental literacy by working to understand and develop a strong sense of place at the school. Whereas this case proved effective for some, other students began to critically reflect on the negative impacts they had on the Earth.

Demarco was an African-American male graduate of 2014 who completed his senior thesis YPEAR project on "The Effects of Technology Used in Field Research on Students' Perceptions of Science." He was very active in the school's field research team, and was the leading expert on GIS technology. To add to this mix, Demarco had a very unique sense of humor that reflected what a critical thinker he was. He volunteered to participate in the exit interview, but was struggling with his final conclusions. When asked what his project had to do with sustainability, he realized,

> Alright, my project has to do with sustainability in a way that people can collect and, uhm, can collect, like, it's literally technology. We're literally breaking rock apart and then we're melding it together and then we're smithing it into a GPS and then we're making these little radioactive chips that go into computers, so it's not sustainable in any way, like we're just destroying the planet trying to fix it with technology. It's pointless.

Whereas Demarco realized how technology could help do research, he also realized in the end the same technology would be causing the problems he was studying. Whereas this quote substantiates the theme of care and participatory dialogue, and he was not afraid to share his beliefs and was deeply caring about his impact, the codes of lack of

humor and trust in the community were atypical for him. His tone was that of someone who felt hopeless and powerless. This was one of the many times I stopped to reflect on the impact the YPEAR project was having on our students. Several reflections on the main characters from Act I are presented below.

Researcher's Reflection on Act I

I begin by reflecting on Victoria's ideological journey. The *Center for Ecoliteracy's* (2015) "A Systems Perspective" page recommends a shift from objective knowledge to contextual knowledge, which would require a school's curricular model to shift from teaching students' objective truths in the form of content specific learning targets to providing transformative spaces that would allow students to learn in a way that is relevant to their lives.

I have chosen the DNA double helix model to illustrate the theme of critical theory and curricular ideologies in this study through a systems perspective lens (see Figure 4.6). I chose this model for several reasons. First, this shift is not a linear progression, but more of a three-dimensional spiral. Second, DNA provides a symbolic representation of the understanding of life. Finally, DNA was selected to suggest the analogy that just as mapping the Human Genome Sequence did not prove effective in determining what genes were expressed, nor will a standardized curriculum determine who will become a quality citizen. Simply put, having information does not mean it will be expressed.

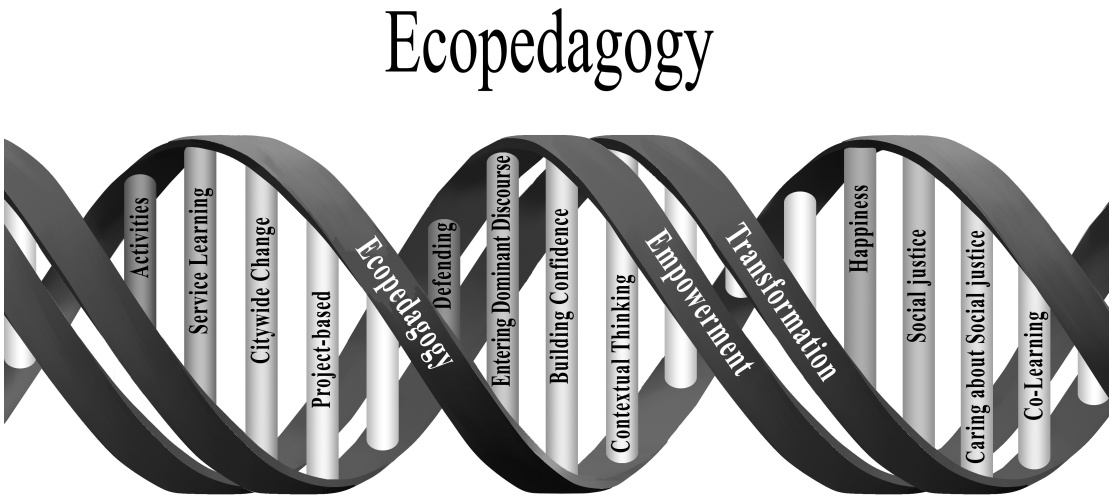

Figure 4.6: *Victoria's Journey.* This DNA graphic presentation of Victoria's journey is meant to emphasize the cyclical nature of developing environmental literacy. The rungs of the ladder represent a shift to systems thinking that Victoria addressed when talking about her senior thesis YPEAR project leading to the development of specific environmental literacy outcomes.

To interpret this graphic, imagine "unzipping" the double helix in the same fashion a polymerase enzyme would in the nucleus of a cell. Reading from left to right, the first rung represents a specific environmental literacy outcome addressed by her journey, the second represents one of the three themes revealed after a critical analysis of the information, the third rung represents key topics Victoria discussed, and the last rung represents a suggestion for shifting to a systems perspective. The molecule is divided into three sections.

The first section focuses on how Victoria gained knowledge about healthy emotional and physical choices. This environmental literacy outcome became manifest by her stories of service learning and goals to create citywide change. Victoria's journey also demonstrated how her focus shifted from objective knowledge to contextual knowledge through project-based learning.

The second section focuses on how Victoria gained skills defending simplicity, care, and peacefulness. This environmental literacy outcome became manifest by her lack of fear entering into the dominant discourse and through providing confidence building opportunities. Victoria's journey also demonstrated how her focus shifted from objective knowledge to contextual knowledge through contextual thinking.

The third section focuses on how Victoria demonstrated a disposition of happiness. This environmental literacy outcome was evident by caring about social justice issues. Victoria's journey also demonstrated how her focus shifted from objective knowledge to contextual knowledge through facilitating co-learning opportunities for her peers and adults.

Offering opportunities for project-based learning, contextual thinking and co-learning are three ways the *Center for Ecoliteracy* (2015) suggests in order to shift to a systems perspective. This, in turn, is considered a step towards developing environmental literacy. For Victoria, this development was demonstrated by her increased knowledge of healthy emotional and physical choices, her improved skills in defending simplicity, care, and peacefulness and her overall disposition of happiness.

In reflection on Mika's networking for eco-justice and planetary citizenship, I constructed figure 4.7. It uses the *Center for Ecoliteracy's* core ecological concept of networks to present the themes shared by Mika. A network concept believes that all living things are interconnected through a web of life in order to survive.

Figure 4.7: *Mika's Networking for Eco-Justice and Planetary Citizenship.* This networking graphic presentation of Mika's journey is meant to emphasize the interconnectedness of developing environmental literacy. The points on the web represent themes and specific topics Mika addressed when talking about her senior thesis YPEAR project.

Here, the model displays how Mika developed specific environmental literacy outcomes through her senior thesis YPEAR project. Specifically, she gained knowledge about physical and ecological systems through her repurposed green wall project. It also demonstrates how Mika gained skills evaluating potential solutions to the environmental issue of food waste. Finally, this model depicts how she presented a responsible disposition by acknowledging that her actions are tied together with the Earth.

Similarly, in reflecting on Lucas and the cycle of care and participatory dialogue, I constructed Figure 4.8, which uses the *Center for Ecoliteracy's* core ecological concept of cycles to share Lucas's thoughts and ideas. The cycle concept believes there is an

exchange of resources through local cycles and that these intersect with larger regional and global cycles. These intersections result in an interdependence with ecosystems and communities.

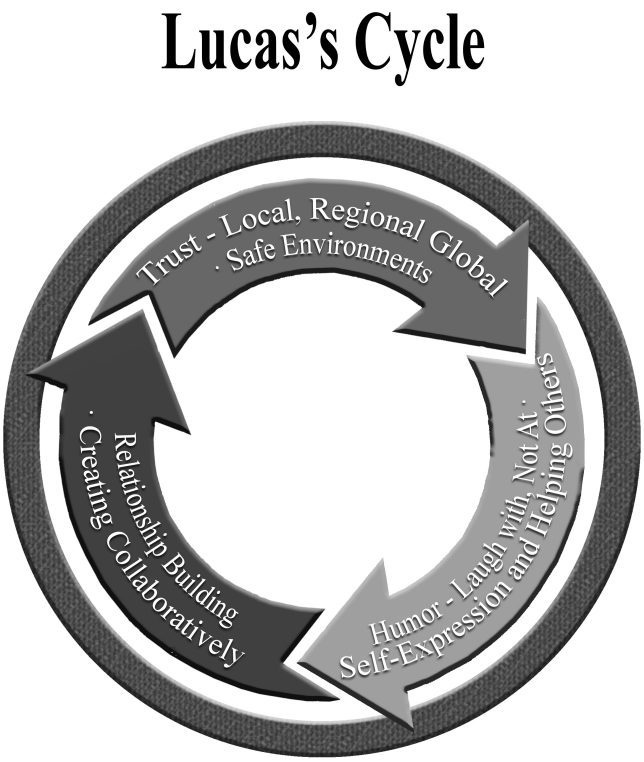

Figure 4.8: *Lucas's Cycle.* This cyclical graphic presentation of Lucas's journey is meant to emphasize the interconnectedness of developing environmental literacy. The phrases in the arrows represent themes and specific topics Lucas addressed when talking about his senior thesis YPEAR project.

This figure also displays how Lucas developed specific environmental literacy outcomes through his senior thesis YPEAR project. Specifically, he gained knowledge that created a strong sense of place by creating a safe environment for students to express themselves with his project. It also illustrates how Lucas gained skills collaborating with the community through his collaborative songwriting workshop. Finally, this model depicts how he presented a caring disposition by helping others express themselves when they were going through hard times.

Act II: Empowerment

This section explores how three themes—student-centered learning, power dynamics and resiliency—operationalize the construct of empowerment. These themes emerge from verbatim quotes the students shared at various points in the process.

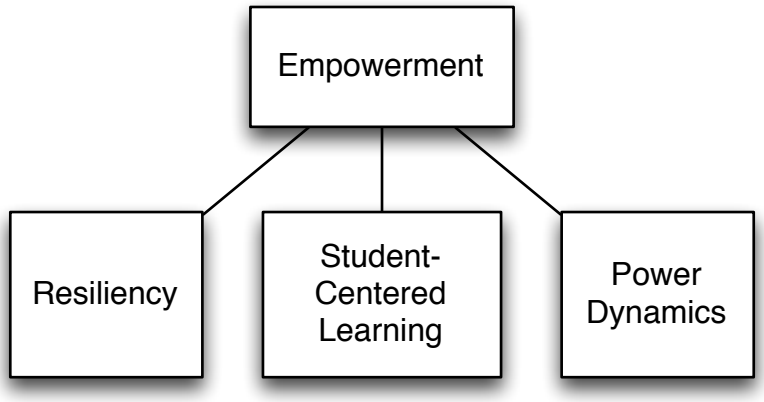

Figure 4.9: *Empowerment Themes.* Multiple themes overlapped to operationalize empowerment as a construct. These themes substantiate that empowerment affects the development of urban high school students' environmental literacy.

Scene I: Student-Centered Learning

Student-centered learning offers a fundamentally different approach to teaching and learning that is uncommon in high school programs. Yet, the *Center for Ecoliteracy's* (2015) "System's Thinking" page believes schools need to shift their curricular models to a way that is relevant to students' lives. My critical analysis of the Senior Thesis YPEAR project noted students had opportunities to: Choose their own topic, select something they were interested in, and take action towards something that was relevant to their lives.

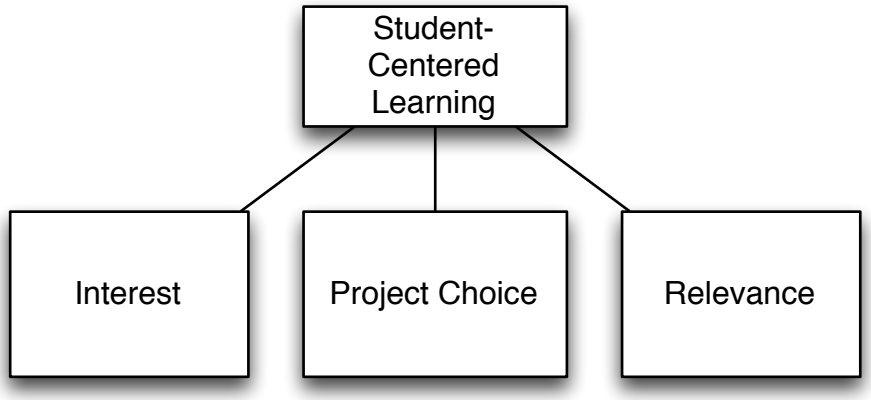

Figure 4.10: *Student-Centered Learning Codes.* Multiple codes overlapped to develop a rich theme of student-centered learning, which substantiates that embracing a student-centered learning pedagogical approach affects the development of urban high school students' environmental literacy.

Luis exemplified the student-centered learning theme.

Main character: Luis. Luis was very passionate about his senior thesis titled, "In what ways does having youth art shown in public space affect young people's self confidence?" One quote that substantiates this theme came from mid-year interview, when Luis was asked the question, "How did you come up with the idea for this project?" Luis paused for a moment, and then responded with,

> I used to always like to draw ever since I was little and I used to get in trouble a lot because I would draw too much at school so I figured, like, if I had somebody to be like 'your art is worthy' it would be, like, way better than it is. Like I feel like I would've been like way better, I would've been in a better place than I am, I would've been more better with my art and maybe somewhere that I should have been.

Luis' statement about getting, "in trouble" because he would "draw too much" demonstrates his project was relevant to his past experiences. He became the "somebody" he wanted, by showing other students that their art was "worthy" enough to be hung in a gallery along side other artists. This is significant to him because he felt that his passion for urban art placed him in the wrong crowds at other schools. He continued with,

> I guess at other schools you just hang out with the crowd I guess and that would like decide what group you are in. And I guess I was like not in the best group that I should have been in, so I'd just like really messed up at other schools.

This is related to the code of relevance where Luis reflects on his past and emphasizes the importance of finding a positive crowd to do art with. This is significant because the theme of student centered learning affected the development of environmental literacy skills in the students in art club that Luis helped create by providing them with opportunities to engage in dignified interactions and to flourish without harm while participating in something they loved.

Luis' was very passionate about his project, and his interest came from years of bad experiences in schools. In an attempt to get as much depth as possible, the questions asked in the interview were very general. One specific question asked, "Why are you doing this project?"

> I feel like I'm kind of more responsible like with my own stuff . . . like of what I do and stuff. I'm, I don't know, I do feel more confident in everything I do. Like at my old school, like some of the reasons I didn't go to class and stuff was because like a I was either too late to learn that and I didn't feel like confident in going and feeling dumb. But here, like you can probably still look dumb but it won't make you *feel* dumb, it will like boost your confidence instead of like dropping it like instead of having a teacher just calling you out you know for not knowing anything.

The phrases Luis used such as "it won't make you *feel* dumb" and "boost your confidence" emphasis his interest in his project's ability to shift how students feel about themselves. For him, taking the role as "teacher" in his project meant he would make a point to not "call you out for not knowing anything," which obviously had a lasting impact on how he felt about himself. This is related to the code of interest where Luis wanted students to feel good about their work and themselves. Luis' project, in turn,

helped students develop of environmental literacy by providing opportunities to gain knowledge about and work with their feelings.

According to Luis, as the students worked on their art, they talked about life and what their pieces meant. Often, these pieces represented how the students fit into the world, and they experimented with using reclaimed "canvases" of scrap wood, logs and used coffee burlap sacks. This is significant because it depicts how the theme of self-centered learning is a way to operationalize ecopedagogy as students learned to talk about their feelings in relation to the world.

A final way Luis exemplifies the theme of student-centered projects was the through his long-term vision of his project. After the specific interview questions were completed, the students were asked, "Is there anything else you would like to share?"

> Yeah, yeah, what I want to do is to make this like . . . I want to come back in a couple of years and be like 'where's our club?' you know it's kind of feel good thing, like making the school money for art.

When Luis refers to, "making the school money for art," he means that his school art club has held several gallery nights to sell their work. For him, this act of selling art to the public not only helps students feel good about themselves, but it is a way to sustain the art club. The students planned to take a trip to an art museum and purchase art supplies with the money they raised.

This is related to the code of project choice, as Luis identified that some wants that students had for supplies and trips, and found a way to fit it all in. This affected their development of environmental literacy by providing them with opportunities to reflect and practice thoughtfulness. This is significant because is demonstrates that the theme of student-centered learning is not the same as self-centered, but rather allows for students

to critically reflect and be thoughtful of their place in the school and community. This theme—student-centered learning—was substantiated by many of the students, including Khalil, Angel and Christopher.

Supporting roles: Angel, Khalil and Christopher. Student-centered learning emerged as a theme as most students commented about how important their voice was in their project. During his exit interview, Angel reflected on how he came up with the idea for his senior thesis project.

> I came up with my idea because, uh, cause teens these days are not really doing anything healthy, all they're really doing is just doing gang activity or smoking weed or just staying at home playing Call of Duty or any other games. I want to reach out to more people so instead of being all scared of gangs, you know, people should just be happy, and just enjoy their day, and just ride their bikes.

Angel, a Latino male alumnus, was a passionate BMX bike rider, and his project helped students learn how to fix and maintain their bikes. For him, he felt that many students stopped riding bikes as kids because their bikes would break, they couldn't afford to pay to get them fixed and they didn't know how to fix them themselves. He also talked about how riding bikes really helped you get to know your city, and "be happy." This related to the code of interest and demonstrated one way to operationalize empowerment as students learned the skills necessary to take care of their own bikes.

Khalil, an African-American alumnus of the school, talked a lot about how his experiences with his senior thesis project were different than any other experiences he has had at other schools. One quote he had that substantiates the theme of student-centered learning related to the sharing of his knowledge at his senior presentation night.

> Actually presenting what you're learning instead of going to a textbook and just giving it to your teacher. I mean, your teacher knows you're learning but the community doesn't know what you're learning. Well, I mean, they know because they learned the same thing. Another thing along with that is just learning what you want to know. Learning what you want to learn and how you want to learn it. It's just been the most amazing experience of my life.

For Khalil, the process of learning what you want and sharing it with the community made it not only relevant, but also empowering. His comment that the community knew what you would be learning from a textbook, "because they learned the same thing," is another powerful comment about the structure of a traditional classroom. For him, this meant that he thought the community would not be interested in learning the content students learned from a textbook, yet they showed up excited to see what he was learning at his presentation night.

Whereas Khalil felt the senior thesis YPEAR project was "the most amazing experience of my life," not every student felt as empowered. Christopher is one of those students who really wasn't sure what he wanted to do, and really wasn't passionate about his project in the ways other students were. When reflecting on how he choose his project, he responded with,

> So I guess, you know a lot of the stuff, it wasn't really me . . . I mean it was me I picked it you know I picked this project, I mean I did choose it I did want to do these things but they were kind of handed to me like you could do this and you can do that if you want to do it . . . but it wasn't something that just like popped into my head. Like I wanted to take the solar training class, you know, they were things like were put on a platter and I got to choose them.

Christopher acknowledged that he "got to pick" his project, and he wanted to do it, but admits, "it wasn't really me." Although he did choose his project, this particular student was coded as "adult selected" for the code of project choice. Although

Christopher never mentioned a project he would have rather been doing, he still lacked the ownership and thoughtful reflection of his project that was demonstrated by his peers.

Scene II: Power Dynamics

A second subtheme—power dynamics—supported the students' sense of empowerment. Many codes in this category came from the discussions and were difficult to present in this format because they manifested themselves in pauses, interruptions, and decision-making. Whereas much was learned by the different leading styles of the staff, this has been left out as it is beyond the scope of this project. Nevertheless, the codes with power dynamics related to students' perceptions of their own power, students' use of their power and students' desire and skills to use their power to empower others. Locus of control, talk time and thoughtfulness highlighted the power dynamic theme. One student that exemplified the power dynamics theme was Ashley, a Latina alumna who graduated in 2014.

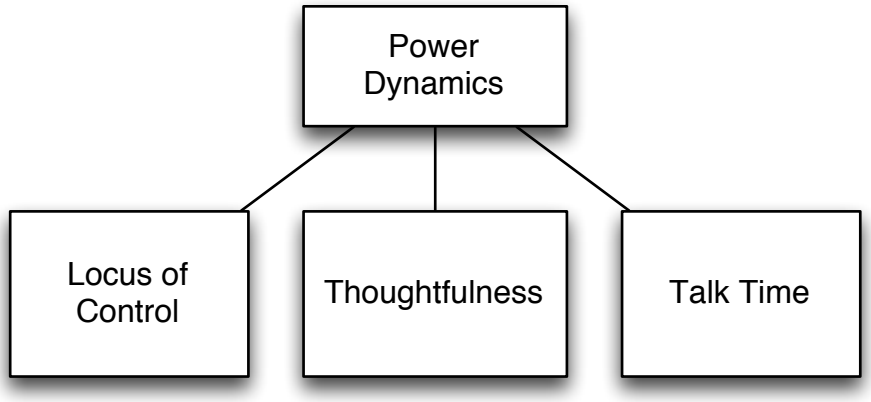

Figure 4.11: *Power Dynamics Codes.* Multiple codes overlapped to develop a rich theme of power dynamics, which substantiates that taking action towards empowerment affects the development of urban high school students' environmental literacy.

Main character: Ashley. Throughout the process of completing her senior thesis YPEAR project, "The Effects of Student Artwork Opportunities on Self-

Expression and Confidence," Ashley learned about students as leaders, built trust in her community and practiced for life so demonstrate the theme of power dynamics. One quote that substantiates this theme came from her end of the year reflection when she was asked to elaborate on the process of creating the school mural.

> I was just kind of giving students an opportunity to uh, just because I was leading it I didn't want the students to feel like, "oh, I have to follow in her lead." I sat back a little and let more of the students give their input and show me how I could do this different, or how could they contribute to that part of the mural, so I was really following their lead and kind of going in the direction they wanted to go, and just kind of giving 'em a little bit of guidance here and there

Statements such as, "I sat back a little" and "I was really following their lead" demonstrated that Ashley understood she was in control, but wanted to give that power back to the students. For her, this means her style of leadership was to create more leaders rather than direct them to do what she wanted. This is significant because it related to the code of locus of control and the rich theme of power dynamics.

However, getting to this place with leadership was not necessarily intentional. When offering advice to incoming students, Ashley admits it wasn't always easy.

> It gives you that time to really work on something that you're passionate about, something you want the community and students to learn about, and to be involved in, uhm, it kind of pushes you a little bit to uh, if you're lazy you're just going to have to crank it out, you know, I had to get out of that because I was kind of lazy.

It was her "laziness" that led her to realize she could trust her community to help her complete her product for her project.

> When, ok, so, I was so stressed out about this, I was like, "this is not going to get done in a week." And there was a couple of times where I had to go to a job orientation and I had to leave the board with the students and I was just like, "they don't know how to do this! I don't know if they know how to do this! What am I going to do?" But when I come back the next day it's, like, halfway done. I'm just like, "ooooh, ok." So that's where I got to kind of like, started to sit back and watch the students develop it more than I was going to develop it.

The moment that Ashley, "started to sit back and watch the students develop it more than I was going to develop it," was pivotal as it demonstrated that she felt the shift in strategy to complete the mural. It was no longer her mural, but the students' mural. This is related to the code of talk time, where Ashley realized she didn't need to be there directing the whole time. This affected the development of environmental literacy skills in her by providing her with strategies for addressing environmental issues through empowering communities.

One final quote that substantiates the theme of power dynamics came in response to the question, "Do you have anything else you would like to add,"

> Uhm, so, EV is a different way to learn, uh, from a traditional school and it helps you, uh, potentially, uh, find skills and build skills that you will need for your career before you actually go into college, and for, uh, future students, well, just you know, just do what you have to do, do projects, stay focused, and you will be pleased when you graduate cause you'll have all this good work that you've already completed to bring along with you for the rest of your life.

Ashley offered advice to incoming students like "do projects" and "stay focused" to emphasis that the students will have opportunities to do work they could "bring along with" them for the rest of their lives. For her, this means students should be thoughtful with what projects they select, so that it is more than just earning credit, but relevant to who they want to become. Ashley's "practice for life" was significant as it provided opportunities for her to increase the development of environmental literacy by practicing

researching, taking action, reflecting and adjusting to complete her project by the end of the school year.

These codes, locus of control, talk time, thoughtfulness and the theme of power dynamics were substantiated by many of the students, including Jennifer, Khalil and Justin.

Supporting roles: Jennifer, Khalil, and Justin. One quote that supports the power dynamic theme came from Jennifer during her mid-year senior thesis review. During this interview, Jennifer reflected on her role as a leader,

> You know it comes back to that leadership role because it's like me and my friend we have a lot of leadership and when we like go out a lot of people are just like I mean a lot of people know us and I don't even know how they know us but they know us and sometimes people look up to us and so without us even knowing it and so it's like why don't we like give them the help that they need with the leadership that we have.

Jennifer recognized that "people look up to" her and her friend, and together they decided to "give them the help that they need." This emphasized that she was aware of her locus of control, and spent time reflecting on what she wanted to do with that power. Another quote that substantiates the power dynamics theme came from Khalil's reflection during his exit interview.

> Over the weekend when I was finishing up my project I thought about it, and I'm always telling all these students, if you're a freshmen, sophomore, or junior, I'm telling them, "start working on your senior project. At least you have an idea," you know? But I'd say do projects that lead up to your senior project. Because, without noticing it, I was going through some old pictures, there's this picture of me at presentation night, and I was doing a project on the elements of Hip Hop, and I didn't realize that was my project, a major project I did last year. And my senior project is like taking elements of Hip Hop and using them in the community. So I'd say, like, all your projects can tie in together, so why not make them all fit together? Especially like a build-up to your senior thesis project, so…

Khalil used action words such as “lead up” and “build-up” when recommending how students could get prepared for their senior thesis YPEAR projects. For him, this meant a type of scaffolding of projects before “using them in the community.” This related to the code of thoughtfulness where students think about where and who they want to be and take action to get there. This was significant as it demonstrated Khalil’s development of environmental literacy by practicing researching, taking action, reflecting and adjusting to complete his project. However, although Khalil may have been ready to take those steps, not every leader is ready.

In her influential book *Teaching to Transgress*, bell hooks (1994) described teaching as "a catalyst that calls everyone to become more and more engaged," (p. 11). As powerful as this teaching method may be, not everyone trusts their community to work, and as Justin pointed out when reviewing Khalil’s project, there was still a lot of dependency on adults,

> Even if you look at all of his acknowledgments, they're all adults. Everybody who works at this organization is an adult. Everybody at that organization is an adult at least all of the teachers and faculty that worked with them they were all adults. And I think even making this poster as a student we have to take items for you guys because whenever getting a good grade because you could tell me all the stuff in the world about what needs to be corrected on the poster, but if I don't take it, I'm going to fail.

Justin’s critique of the process was spot-on in the case of the senior thesis YPEAR project. He pointed out that the community organizations that Khalil worked with were all led by adults, and that the senior thesis project itself was ultimately in the hands of the adults. For him, this meant that the project could never be truly empowering, because it was a requirement by and the power remained in the hands of the adults. As adults, it is important to empower our students to provide them with opportunities to build resiliency.

Scene III: Resiliency

Resiliency as a subtheme of empowerment emerged in this study. According to Garmenzy (1991), who published the first research based on resilience, there are several characteristics of resilient children including: positive peer and adult interactions, a positive sense of self, low degrees of defensiveness and high degrees of participation and cooperation, a sense of personal power and an internal locus of control. For the purposes of this study, three codes emerged that addressed the theme of resiliency: Participation, change in awareness and overcoming obstacles. One student that exemplified resiliency was Jacob, a white alumnus who graduated in 2014.

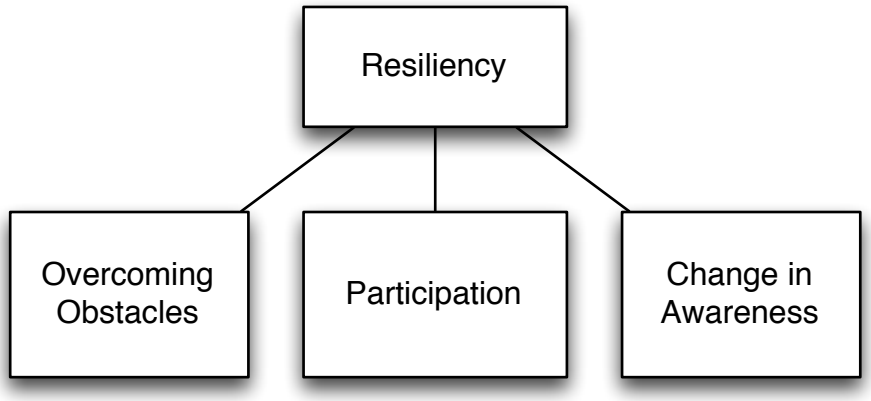

Figure 4.12: *Resiliency Codes.* Multiple codes overlapped to develop a rich theme of resiliency, which substantiates that gaining strength from adversity affects the development of urban high school students' environmental literacy.

Main character: Jacob. One of the original students at the school, Jacob was extremely proud of his senior thesis YPEAR project, "The Effects of Bike Education on Number of Urban Youth Comfortable Biking." He planned his project starting his junior year by writing a grant to receive a fleet of BMX bikes for the school. Throughout his reflection, he touched on all three codes the developed the resiliency theme: Participation, change in awareness and overcoming obstacles.

One quote that substantiates the resiliency theme came from Jacob's exit interview when he was asked what changed in his project,

> Uhm, what changed from my original first copy of my project, was at first I wanted to build skate parks in Milwaukee, but then I found out that what I'm really working at isn't really working toward that, its working toward just this school getting to ride bikes, and getting the word out there "you can ride bikes at school, and it's good for you, gets your muscles going, and it keeps your brain working, you know, just a little relaxation from school, just that little bit is what you need," and it's actually been proven if you have a little break from school periodically, it helps you.

Statements such as, "what I'm really working at" and "getting the word out there" demonstrate that Jacob shifted his focus from something more complicated to what he considered the "root issue." For him, the priority was offering access to bikes for students' who didn't already have them, which was coded as participation. Jacob not only provided bikes for the school, but also worked with a local non-profit to provide classes to teach students how to ride safely in the city. This is significant because it helped develop students' environmental literacy by providing opportunities to explore their interest in biking.

Another quote that substantiates this theme addressed Jacob's change in awareness as he met other adult role models,

> My bike hub teacher actually went 300,000 miles in the whole year on his bike alone. That's like the definition of sustainability right there--300,000 miles on a bike! And, I just feel like if we could just bike more, like everyone bike more for transportation, it would be more, everyone would be more friendly and eco-friendly too.

Jacob suggested that if everyone just "bike more for transportation," then we would all be "more friendly and eco-friendly." For him, he decided on his project because biking was fun and healthy, but as his project evolved he recognized the environmental issues that were also being addressed. This change in awareness is significant as it helped

him develop his environmental literacy skills for identifying environmental issues.

A final quote that substantiates the resiliency theme relates to the code of overcoming obstacles. When asked what was something that was unexpected about his project, Jacob responded with,

> It was a long process, it was, took a lot of waiting, and just, you know, just waiting for people to come in, waiting to go to the bike shop to get the bikes, waiting to get the helmets, and then we got everything and the worst part was just we have everything but we can't do anything yet because it's winter and we can't go on a bike. So just looking at that, it was just horrible to see all the bikes up there and not being able to ride. But then I was happy with what came out and people were actually like actually down to do it, like, "yeah, let's go ride bikes during school." I thought there were going to be a couple people in my class but a lot more people showed up, and that made me very happy.

For Jacob, although the waiting through winter was "horrible," he was very happy that people were "down to," bike when they had the chance. This relates to the code of overcoming obstacles as he continued to plan for his project. He also reflected on his long journey transitioning into project-based schools,

> It's kinda like college, it's like you don't have people on your back to tell you what to do. I want you to keep that in mind because my freshmen year in my project-based school, I failed. I had to repeat it because I only got three credits that year. But then once I found out the project-based learning, I finally started going into it and I made eight credits by my next year jumping me into junior year.

According to Jacob, it took until he "found out the project-based learning" before finally "started going into it," and began to earn credits. It took him his entire freshman year to figure it out, but he stuck with it demonstrating the theme of resiliency. Participation, change in awareness and overcoming obstacles also overlapped into a rich theme of resiliency in other students' work, including Anthony, Ashley and Jennifer.

Supporting roles: Anthony, Ashley and Jennifer. Anthony was a Latino alumnus who completed his senior thesis YPEAR project, "In what ways does learning and sharing basketball opportunities affect health, self-esteem, happiness and collaboration of urban youth?" in 2014. He volunteered to participate in the senior exit interview, and discussed how his project changed over time,

> I think I did better than I expected. At first I thought I was not going to, like, do it because it's 300 hours! But I tried my hardest to do my project and I finished it.

Anthony used the phrases "tried my hardest" and "better than I expected" to reflect how difficult the process was for him. Anthony struggled with overcoming obstacles and the long process, but continued to push through. He remembered,

> At first I was going to try to build a basketball court around the city, but it didn't happen so I started, like, lower. I built a basketball hoop for the school in the alley and I did research on the people that works with the parks to see if they can fix them.

For Anthony, it was a tough transition when his first idea "didn't happen." The idea of starting "lower" was difficult for him, and he recalled that for weeks he did not work on his project at all. This is significant, because he did overcome obstacles which substantiates the theme of resiliency.

Another quote that substantiates the resiliency theme came from Ashley's exit interview, where she recalls,

> That was also my biggest challenge here, was to like, that little bit of motivation, that self-motivation that's just like, and procrastination. Oh my god I'm the biggest procrastinator. But once you get in that mindset that's like, "if I knock this out, this out, and this out, then I'll only have this, this, this." And it gets easier the more you do it, the more you put into it, make it into a habit of making sure you're on point with all your writing assignments, on point with all the credits you need, and not focusing on an art credit because you're so good at art you're just going to keep doing art.

Ashley suggested that students need to "make a habit" of making sure they were "on point" with the credits they needed, rather than just focusing on what they were good at. This is reflected by the code participation, and substantiates the theme of resiliency as Ashley demonstrated that it got "easier the more you do it," as she worked to overcome her root issue of procrastination.

One final quote to came from Jennifer as she changed her awareness about her project,

> I said like so many times how I was gonna dropout and like nobody really took me seriously even though I was just playing, sometimes I was serious and I was at that point like . . . I can't do this, I really can't do this. And all the staff here they just kept pushing me and just made me like, a young adult and mature in a lot of ways and just become that positive role model

Jennifer said that at times she felt like she "was gonna dropout"," and at some points she said to herself "I really can't do this." However, she kept working and was proud of how far she had come and felt like "a young adult," who had become a "positive role model." the interview took place mid-year and there was still a semester worth of work to go.

Unfortunately, two students left the school during the process. One transferred to traditional large public school, where she planned to take two math credits she needed to graduate. She felt the senior thesis project was too much work and did not think it was fair that it was a graduation requirement. The other student seemed to fully embrace the senior thesis project, but dropped out completely. She turned eighteen, moved out of her house, and slowly began to miss school. After she missed her first deadline to present her poster, she only returned once. Although there were built in make-up opportunities, she felt she was too far behind to complete the work. Of course, as with many urban

students, both students were accustomed to transferring schools and moving, and it was very likely that their home situations were also a significant factor in their decision to leave. Nonetheless, the senior thesis YPEAR project may have been the cause of their not completing high school rather than helping them develop skills of resiliency. This was another time I took pause to consider the impacts of the YPEAR project on our students. Several reflections on the main characters from Act II are presented below.

Researcher's Reflection on Act II

I begin by reflecting on Luis's empowering journey. The *Center for Ecoliteracy's* (2015) "A Systems Perspective" page recommends a shift from focusing on objects to focusing on relationships. Escuela Verde's senior thesis YPEAR project encouraged a shift from learning about objects to building relationships by providing opportunities for students to learn in a way that was relevant to their lives through student-centered learning. This, in turn, affected the development of their environmental literacy knowledge, skills, and dispositions that I have depicted in the Figure 4.13 below.

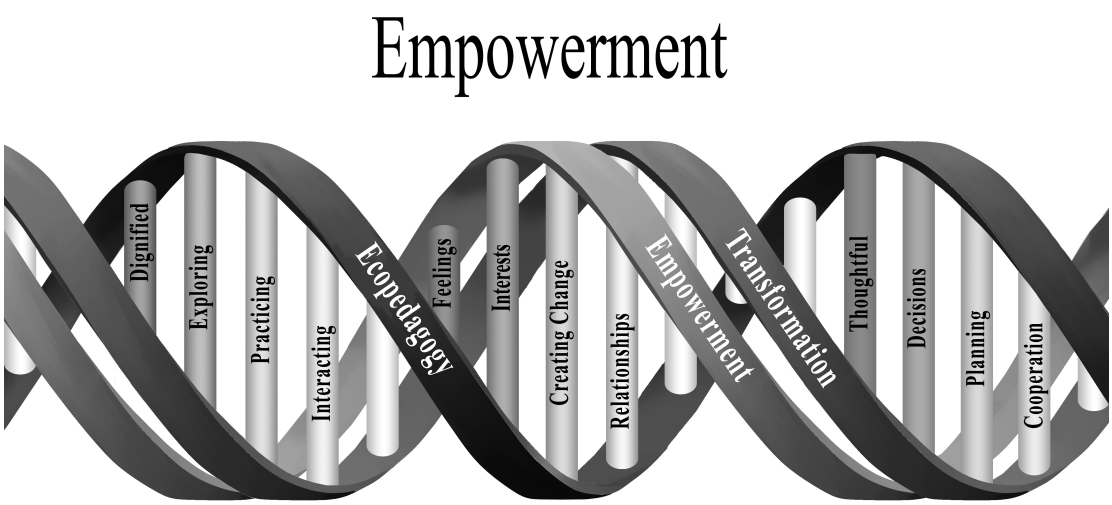

Figure 4.13: *Luis's Journey.* This DNA graphic presentation of Luis's journey is meant to emphasize the cyclical nature of developing environmental literacy. The rungs of the ladder represent a shift to systems thinking that Luis addressed when talking about his senior thesis YPEAR project leading to the development of specific environmental literacy outcomes.

Just as the DNA model above, "unzip" the double helix and read from left to right. The rungs represent: a specific environmental literacy outcome, a theme, a key topic, and a suggestion for shifting to a systems perspective. The molecule is divided into three sections.

The first section focuses on how Luis gained knowledge of and had the opportunity to work with his feelings. This environmental literacy outcome became manifest by his ability to pursue what he was interested in as well as providing opportunities for change. Luis's journey also demonstrated how his focus shifted from focusing on objects to focusing on building a network of relationships.

The second section focuses on how Luis gained skills engaging in dignified interactions to flourish without harm. This environmental literacy outcome became manifest by his exploring culturally-relevant topics through practicing art for positive

self-expression. Luis's journey also demonstrated how his focus shifted from objects to relationships by providing opportunities for students to interact with each other and their environment by using natural and reclaimed "canvases."

The third section focuses on how Luis demonstrated a disposition of thoughtfulness. This environmental literacy outcome was evident by his caring about the future of the art club, and his excitement to visit in the future. Luis's journey also demonstrated how his focus shifted from objects to relationships by providing opportunities for cooperation and consensus.

Offering opportunities for students to build a network of relationships, to interact with each other and their environment and to cooperate and build consensus are three ways the *Center for Ecoliteracy* (2015) suggests in order to shift to a systems perspective. This, in turn, is considered a step towards developing environmental literacy. For Luis, this development was demonstrated by his increased knowledge of his feelings, his improved skills engaging in dignified interactions to flourish without harm, and his overall disposition of thoughtfulness.

In reflecting on Ashley's dynamic power balance, I constructed Figure 4.14 below, which uses the *Center for Ecoliteracy's* (2015) core ecological concept of dynamic balance as a template to present her experiences. The dynamic balance concept believes that while a community maintains a relatively steady state, there will always be continual fluctuations. These communities act as a feedback loop, and this balance provides resiliency within the community, as populations learn to thrive together.

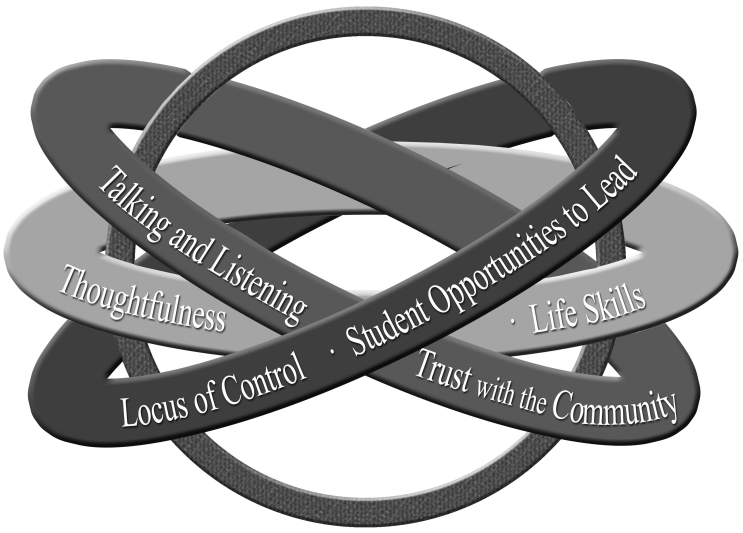

Figure 4.14: *Ashley's Dynamic Power Balance.* This dynamic balance graphic presentation of Ashley's journey is meant to emphasize the fluctuations of power necessary to the development of environmental literacy. The tilted rings represent themes and specific topics Ashley addressed when talking about her senior thesis YPEAR project. These rings depict that sometimes these ideas may be "on top," or more important and other times they will be less of a focal point.

This model displays how Ashley developed specific environmental literacy outcomes through her senior thesis YPEAR project. Specifically, she gained knowledge about strategies that could be used to addressing environmental issues by learning to trust her community to take the lead on her project. It also demonstrates how Ashley gained what she called "life skills" of researching, taking action, reflecting, and adjusting her final product. Finally, this model depicts how she had an internal locus of control and used this to empower the students working with her on her project to take the lead.

Similarly, in reflecting on Jacob's ebb and flow to resiliency, I constructed Figure 4.15, below, using the *Center for Ecoliteracy's* (2015) core ecological concept of flows. The flows concept believes there is a constant flow of energy that drives most ecological

cycles, and this energy sustains life on Earth. Whereas some energy is lost as heat in every transfer, it is necessary that there is an ongoing flow of energy into the system in order to sustain it.

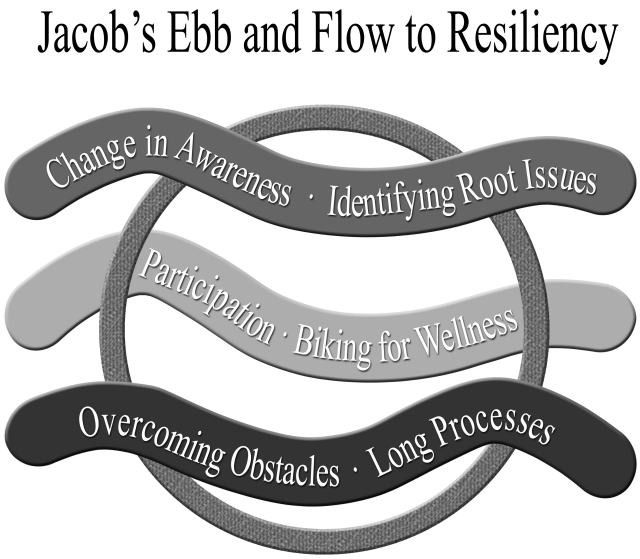

Figure 4.15: *Jacob's Ebb and Flow to Resiliency.* The waves in this graphic presentation of Jacob's journey are meant to emphasize the ebbing and flowing process of developing environmental literacy. The phrases in the waves represent themes and specific topics Jacob addressed when talking about his senior thesis YPEAR project.

This figure displays how Jacob developed specific environmental literacy outcomes through his senior thesis YPEAR project. Specifically, he gained knowledge about the environmental issue of transportation by creating a workshop to teach students and staff how to safely ride in the city. This included overcoming obstacles such as Wisconsin winters and being committed to the long process. It also demonstrates how Jacob gained skills identifying environmental issues by gaining awareness of the root cause of fear and lack of practice rather than his initial plan to simply provide the bikes as resources. Finally, this model depicts how he reflected on his interest in the project and drew the conclusion that as long as students participated, they would increase their wellness and "be happy."

Act III: Transformation

According to Mezirow (1990), perspective transformation is "a process of becoming critically aware of how and why our presuppositions have come to constrain the way we perceive, understand, and feel about our world; changing these structures of habitual expectations to make possible a more inclusive, discriminating, and integrating perspective; and finally, making choices or otherwise acting upon these new understandings" (p.14). This section explores the three themes used to operationalize transformation in this study: Critical reflection, new meaning schemes and activism. Each is substantiated with verbatim quotes from students at various points in the process. I will begin by exploring several ways the inputs of the school's justice curricular lens helped the operationalize transformation.

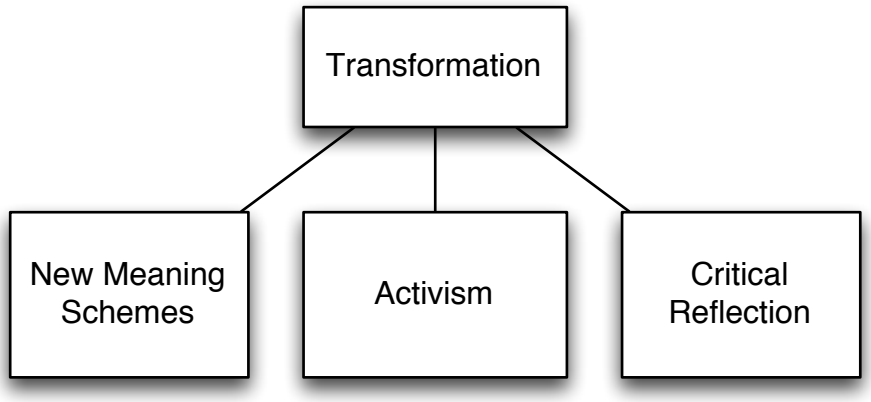

Figure 4.16: *Transformation Themes*. Multiple themes overlapped to operationalize transformation as a construct. These themes substantiate that transformation affects the development of urban high school students' environmental literacy.

Scene I: Critical Reflection

In his foundational text *Pedagogy of the Oppressed*, Freire (1970/2005) stressed the importance of societies entering into *conscientizacao*, or critical consciousness. This concept focuses on both the oppressors and oppressed achieving an in-depth

understanding of the world taking into account socio-political inconsistencies. Likewise, Mezirow's (1990) transformative learning theory believed critical reflection was an essential process to deconstruct meaning. The students' YPEAR projects provided many opportunities to critically reflect. This section will explore the three codes that developed the critical reflection theme: Value of school, disorienting dilemmas and relationship with peers. One student who exemplified critical reflection was Emily, a Latina alumnae who graduated in 2014.

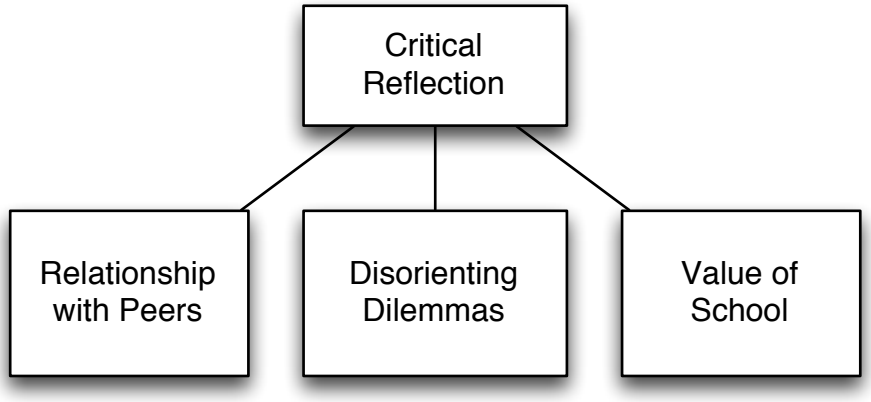

Figure 4.17: *Critical Reflection Codes.* Multiple codes overlapped to develop a rich theme of critical reflection, which substantiates that reflecting critically affects the development of urban high school students' environmental literacy.

Main character: Emily. Emily was a well-spoken bilingual student with a passion for cooking. Her senior thesis, "In what ways does Mexican/American cultural identity affect the influence for healthy living on the south side of Milwaukee?" was a great precursor to her post-secondary journey into the culinary arts. Although only spending one year at EV, Emily reflected on the freedom she had to explore her passions during her exit interview,

> Being like my first and last year, I like it. Coming from like another project based school I was expecting the same thing, so like, I don't know, like at my old school it was hard to do what I wanted. Like we still had a lot of restrictions. Yeah, it wasn't as fun or effective, uhm, a lot of students left there as if it were traditional school, like the same feeling, anxiety, you know, so coming here I was expecting that same thing but it was completely different, and it was awesome. I liked it.

The phrases, "it was hard to do what I wanted" and "had a lot of restrictions" emphasized that not all project-based learning schools were alike for Emily. For her, these restrictions made the previous school not as fun, nor "effective." This related to the code the value of school where students reflected on what the point of school was. For her, the increased freedom reduced her anxiety, which made her experience "completely different" from her past schools.

Another quote that substantiates this theme came when Emily realized money was not the reason some people didn't eat healthy food. She was asked the question, "What is one thing that surprised you about your project," and responded,

> I think it was when I went to visit Heidi and Lyle at their home and they were talking about how most of their family, growing up, were very unhealthy and it kind of struck me because they're not low-income. They have money and they have a lot of resources but they weren't using them well, and it just kind of struck me. It's not so much about, well, it could be about money but it also could be just knowledge, to use what you have.

Emily used the phrase "it kind of struck me" several times to emphasis that she really thought about how something was different than what she previously believed. For her, this meant that money was important, but so was "knowledge, to use what you have." This related to the code of disorienting dilemmas where Emily really had to think about healthy food in a different light.

Prior to this, she made the assumption that "low-income" people were unhealthy *because* they did not have money. When she was presented with a situation where people

had money but were *still* unhealthy, she took the opportunity to reevaluate her beliefs. This is significant because it demonstrated how Emily transformed her way of thinking which affected her development of environmental literacy by allowing her time to practice the skills involved in analyzing environmental issues.

One final quote that substantiates the theme of critical reflection came when Emily was asked how she came up with the idea for her project,

> Living in the issue, I guess. Uh, being surrounded by people who struggle with food choices and, uhm, having like available to them resources so that they can be healthier.

For Emily, "Living the issue," and "being surrounded by people who struggle" were key phrases that related to the code of relationships with peers. To her, the community was lacking the resources they needed to be healthy. When asked why she chose this project, she elaborated,

> I guess, hmmm (*pause*), giving other people, like, the tools and like new information that they could use for their own life, like how to garden, how to cook different things with what they have, so that they can keep using it.

Emily wanted to provide people with the "tools" and "new information," including "how to garden," so that they could "keep using it," relating to the code relationship with peers. This is significant as providing opportunities to gain knowledge about gardening increased their development of environmental literacy as it demonstrated how the Earth was essential to the human condition.

Value of school, disorienting dilemmas and relationships with peers were also substantiated by many students, including Khalil, Ashley and Mia.

Supporting roles: Khalil, Ashley, and Mia. Khalil was an African-American alumnus who used his passion of hip hop culture to encourage others to critically reflect

on life. His senior thesis YPEAR project, "How does modeling raptivism affect youth perspective of themselves in their community?" reflected his commitment to helping his peers feel empowered to make change,

> I knew that hip hop would work, you know, to actually make a change because that's what hip hop is for, you know? Like, back in New York, south Bronx, that's why they did it, you know, they wanted to make that change, they wanted to fight against everything they were going through, all the oppression and stuff like that, and that's what I felt was going on in Milwaukee. I feel like there's a lot of oppression these kids are going through like some rough times. When I was going through rough times, I listened to music, and that helped me, and inspired me to make music, so why not just keep that cycle going on, you know?

Like Emily, Khalil was "living the issue" and used phrases like "they wanted to fight" and "there's a lot of oppression" to compare situations in "south Bronx" with Milwaukee. He acknowledged that hip hop music helped him get through "rough times," and he wanted to help his peers by keeping "that cycle going." This is significant as it relates to the code relationships with peers, which substantiates the theme of critical reflection.

Another student who substantiated this theme was Ashley, who reflected about her senior thesis YPEAR project during her exit interview,

> The more I sat back the more they took lead in the project and they really didn't need my help because they were all so confident in the middle to the end that they were just like, "oh, I could do this. She showed me how to do this so I could do this now. And put my little bit of what I know into it. And to contribute to it." So that's what I found, that if you just give students the opportunity to do something and if you encourage them then it's going to be a great outcome.

Ashley noticed that the more she "sat back," the more students took the lead and "contributed to" the project. For her, it was the students' confidence through her encouragement that made their mural "a great outcome." This was significant as she went

through a disorienting dilemma when trying to figure out her leadership style, which substantiated the theme of critical reflection.

Unfortunately, not all students were willing or ready to enter into the critically reflective process. Mia, a senior Latina, was struggling with her senior thesis YPEAR project titled, "What are the effects of circle keeping and positive blogging on gossip and toxic culture within schools?" During the discussion at the strategic planning retreat, Mia made several comments that demonstrated she did not value the process of the project. To begin, she was not interested in reflecting on or helping any of her peers with their projects, "I thought we were just going to get to work on ours, I didn't realize we were going to have to judge somebody else's too." When the staff explained the process to her, and talked about why it was important to help other students as well, Mia cut in with,

> Quick question - did everybody last year write the paper for this project, because what I've seen is that not anybody wrote the paper last year and now it's a requirement which I don't think is fair.

Although the staff tried to explain the value of the project, it was evident that Mia was not interested in anything beyond graduation. As she reflected on her own project, she once again focused on an external locus of control, stating, "I need more help making more workshops or something, or even if I can use some of the other students research because no people are trying to answer surveys this year." To her, it was the students' faults for not answering surveys this year, and she felt that she should be allowed to borrow other seniors' research because of that. Unfortunately, this unwillingness to critically reflect was also a sign of lack of resiliency, and Mia ended up transferring schools mid-year, claiming the senior thesis YPEAR project was too much.

Scene II: New Meaning Schemes

Another code that helped operationalize transformation was new meaning schemes. According to Mezirow's (1990) transformational learning theory, meaning schemes are specific beliefs, attitudes, assumptions and emotions that guide peoples' responses and actions. When new knowledge or experiences create a disorienting dilemma, new frames of reference emerge. Through critical reflection, these may become new meaning schemes.

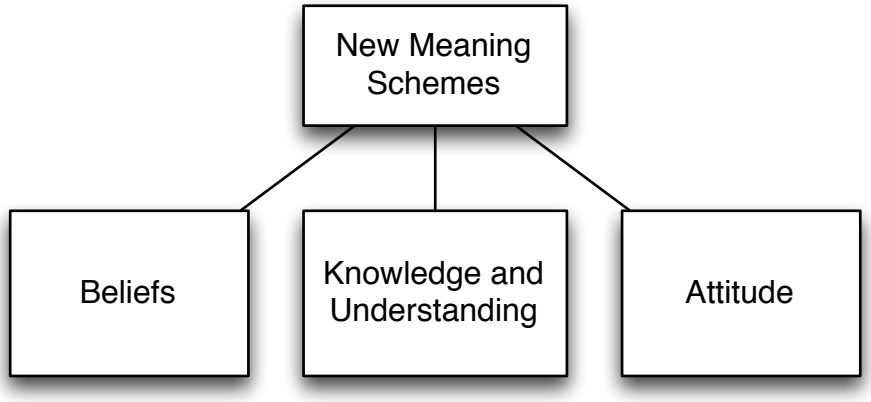

Figure 4.18: *New Meaning Schemes Codes.* Multiple codes overlapped to develop a rich theme of new meaning schemes, which substantiates that considering new meaning schemes affects the development of urban high school students' environmental literacy.

This section explores how beliefs, knowledge and understanding and attitudes supported the notion of new meaning schemes. One student that uncovered new meaning schemes through the process of the senior thesis YPEAR project was Jennifer.

Main character: Jennifer. First introduced to support the care and participatory dialogue theme, Jennifer's reflection on her process of developing and learning, changing over time and coevolving with the community while working on her project authenticates the theme of new meaning schemes. During her mid-year review, she talked about how

her project started as an art park in a community garden, but changed after the first quarter when she realized her interests had changed.

> At first when I started the senior thesis I had a completely different idea and I wasn't into it like I should have been. I feel like I was doing it mostly to help somebody else. So then when I really thought about it I was like why I do want to continue to do this if I'm not like engaged in it? Like, I should be because I'm going to be doing this for the rest of the year. So then I started thinking about it and I was like maybe kids here who don't have these opportunities, like going to outside organizations for classes, like this is like maybe what could be my senior project, how to help students learn new things to be able to alter their clothing.

Jennifer explained how she had a "had a completely different idea," when she started her project, and admitted she "wasn't into it." She knew she had to do something, and just picked a project she was already volunteering for. However, when she "really thought about it," she remembered how much she enjoyed a tie-dye workshop she participated with through at an outside community organization and thought that would be something the students at the school would really benefit from. For Jennifer, this meant the meaning of her project shifted from a requirement to a requirement she felt more connected to. When asked how she felt about the senior thesis YPEAR project itself, she responded,

> I feel like it's a good concept. Because I did do a lot of complaining about the senior thesis project and it being too much but I feel like it really does make an impact on the seniors like it's just like giving them the opportunity to speak on what they think is important in this community

Jennifer admitted in the beginning, she did a, "lot of complaining" and felt like it was "too much" but came to a new understanding that the senior thesis project is "a good concept." For her, this demonstrated that although she didn't like it, she understood the value of the project. This is related to the code of beliefs where Jennifer felt the "opportunity to speak on what they think is important in this community" is more

valuable than the extra work they need to complete. The senior thesis YPEAR project affected the development of her environmental literacy dispositions by encouraging reflection and providing opportunities for her to increase meaningfulness in her curriculum.

Another quote that substantiates this theme came when Jennifer was asked why she decided to do this project,

> Because I know a lot of kids probably aren't that confident in about themselves because they don't have all this expensive clothing but in reality… I'm a sneaker head I know, but I mean I've spent a lot of money on shoes but like I like Jordans and Jordans are so like expensive and I feel like if I really like them and I feel like I need to buy them but in reality I don't. So I've been kind of like trying to not buy shoes and start because why spend $120 on a pair shoes when I could just like um borrow my sisters or something.

Jennifer began to talk about how kids don't need expensive clothing to feel confident, but paused mid-thought to admit she was a "sneaker head " and spent a "lot of money on shoes." She realized she really felt the need to purchase these shoes, but was working on "trying to not buy shoes" and just borrow her sisters. This related to the code of knowledge and understanding, as Jennifer realized her own struggle with consumerism. Although her project was designed to help students create their own sense of fashion through "upcycling," she realized she was struggling with her own desires. This is significant as it relates to the theme of new meaning schemes as she worked to develop her environmental literacy by increasing her knowledge of sociopolitical systems.

One last quote that substantiates the theme of new meaning schemes arose when Jennifer was asked why she choose her project,

> I feel like a lot of people think I'm mean. And I feel like I come off like a mean person at first but then it's just like I don't like to see people welcome as I used to be like before I grew up and matured and started seeing things from other people's point of view I used to be really mean I used to talk about people and I guess it just made me feel better about myself and so then like one day I was just like why? Why am I doing this? What is it doing for me, aside from bringing somebody else down?

Jennifer used talked about how she used to be "really mean" before she "grew up and matured," and "started seeing things from other people's point of view." She went on to elaborate about what influenced her, "one day,"

> I watched all these movies were like kids are getting bullied and committed suicide and I don't want to be a part of that I don't want to be a reason that somebody doesn't want to live.

It took watching "all these movies" to help Jennifer realize the impact of her bullying on other students. She recognized that her love of fashion was one of the focal points of her bullying before she "grew up." This attitude shift influenced her senior thesis YPEAR project and is significant as it helped her develop the environmental literacy skills that support interdependence.

Overall, Jennifer's senior thesis YPEAR project mid-year reflection included Beliefs, knowledge and understanding and attitudes, which illustrate new meaning schemes were substantiated by many of the students, including Mike, Justin and Isabella.

Supporting roles: Mike, Justin, and Isabella. Like Jennifer, Mike discovered he enjoyed working on his senior thesis YPEAR project after it began. Mike was a white senior who was mature and confident, but often kept with his small group of friends. He created a project he knew he could complete, "How does knowledge of technology affect student use of technology in projects?" because he was knowledgeable about videography, but as his project progressed so did his feelings about it,

> I started off doing this project because I had to do it to graduate, but then I kind of just came to the conclusion that if I have to do this I might as well like what I'm doing. So then I started to enjoy teaching students rather than just do the stuff and then when they showed interest in it and actually made it a little bit easier. It just came more naturally and I really liked that.

Although he started the project as a graduation requirement, Mike described how he "came to the conclusion" that he "I might as well like" what he was doing. This attitude change helped him "enjoy teaching students," and after some practice, teaching "just came more naturally" to him. Developing a new meaning scheme about the value of his project was significant because it demonstrated Mike was developing his environmental literacy skills by practicing and supporting interdependence.

Another student who substantiated the new meaning scheme theme was Justin, who began to realize that knowing something was different than deeply understanding it,

> I can say I can teach about racism, but if I haven't been to events that have taught me about it, like read research papers and all this other stuff, I'm not going to know what I'm talking about. I can tell you what I've read about in books, but if I don't have a deep understanding about it, then I can't help you improve your understanding of it either.

Justin drew the conclusion that telling someone what you have "read about in books" is not going to help them improve their "understanding of it." His beliefs shifted to realize the best way to have a "deep understanding" of something is through experiences. He elaborated about the public event he attended that was a "mix of races" all talking about ways they can do to make the city more integrated. This is significant as it helped Justin increase his environmental literacy by reflecting on what meaningful learning is.

However, not every student was in a position to create the new meaning schemes, and they continued to focus on the short-term outcomes of the senior thesis YPEAR

project. When asked what the goal of her project was during the discussion, Isabella simply stated, “What’s my goal? To graduate!” Even though her knowledge of sociopolitical systems was high level, and the focus of her project was on dismantling Western norms, she still saw the whole project as nothing more than a graduation requirement.

Scene III: Activism

Integrating Youth Participatory Action Research (YPAR) into a school’s curriculum offers an opportunity for students to create collective change that addresses a relevant issue in their lives. Adding the eco-justice to create Youth Participatory Eco-justice Action Research (YPEAR) allows for a critical approach to environmental education. Kenis and Mathijs (2012) state, "while the individual behavior change approach generally tends to conceive of the environmental issue in terms of the sum of individual decisions and choices, the collective social action approach stresses the role of social structures and systems in causing environmental problems (e.g. Courtenay-Hall and Rogers 2002; Jensen 2002; Clover 2003; Chawla & Cushing, 2007)," (p. 47).

Environmental literacy is often only measured in peoples’ knowledge, skills, and dispositions (NAAEE, 2011). These attributes skills that focus on identifying, analyzing, evaluating and proposing and justifying actions, but do not include practicing the skills of taking action. Fine-tuned even further, environmentally literate people need the skills of taking collective action with the community so they do not turn into oppressors themselves.

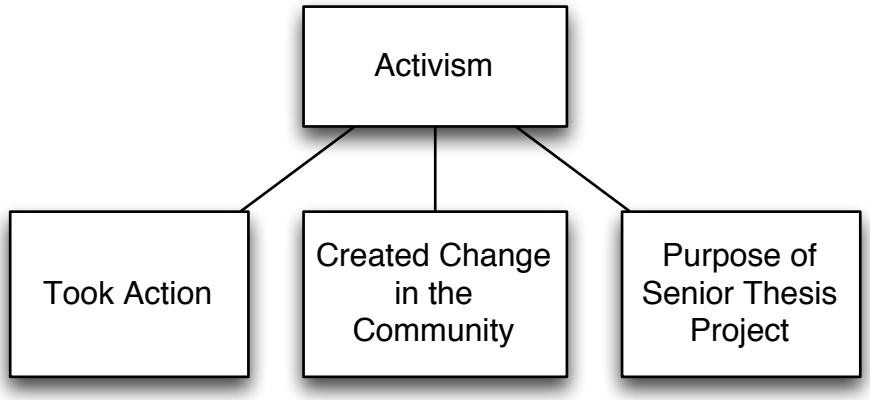

Figure 4.19: *Activism Codes.* Multiple codes overlapped to develop a rich theme of activism, which substantiates that taking action affects the development of urban high school students' environmental literacy.

This section explores how the three codes—Purpose of the senior thesis project, created change in the community and took action—developed the activism theme. One student who exemplified activism was Khalil, an African-American alumnus who graduated in 2014.

Main character: Khalil. Khalil began his senior thesis as a junior, and considered his project a way "perfect his craft." One quote that substantiates the activism theme came from his end of the year reflection when he was asked how he came up with the idea for his project,

> Basically I was just seeing that, um, there's a lot of issues in the community and that besides the issues in the community there are a lot of uhm, teens, that see these issues but don't address these issues because they're either afraid that they can't make a change or they just don't know that they have the voice to make a change.

Khalil wanted to do more than simply take action, he wanted to model taking action in hopes that teens who were "afraid that they can't make a change" or "don't know that they have the voice to make a change," would be inspired to act themselves. For his senior thesis project, Khalil wrote and recorded a hip hop album with lyrics focusing on sustainability. Once he completed it, he did a small tour to local schools and

performed to show students that everyone had a voice. He continued about the research he learned while working on his project,

> It talked about how hip can be used as a tool to actually teach kids a lot of important things besides the issues you can actually teach scientific things, you know, hip hop was originated on empowering the people and you know, just giving a voice to the voiceless.

Khalil made inferences from his research, where he learned that hip hop could be a tool to teach "scientific things" in addition to "the issues," that it was about "giving a voice to the voiceless." This is significant, as the purpose of his project went far beyond graduation, as his goal was to take action to encourage others to take action. He also talked about the lyrics of his songs helping to encourage "multiple perspectives" and think about the "big picture," which helped develop students' environmental literacy by working with a global perspective.

Another quote that substantiated the theme of activism related to the code created change with the community,

> The most powerful action that I took, besides the performance, I mean the performance was a big part of it, relay my message, but um, actually, creating the survey. I got my results back, you know, the results were everything I expected them to be, you know, saying that my music changed your perspective, not only changed your perspective but inspired them to use my, the craft that I use, the tool that I use to make a change in their daily lives. So I had some kids from this elementary school tell me that, you know, "ohh listen to this rap tell me what you think about it" "do you want to help me with this rap?" and stuff like that, so I'm pretty excited about that.

Khalil felt the most powerful action he took was creating a survey to collect data about the impact he made. He collected over 150 student surveys, and discovered that his music "not only changed" their perspective, but "inspired" them to use his "craft" as a "tool" for change. This is significant, because it helps to develop students environmental

literacy by offering a skill to propose and justify actions to address environmental issues. In this case, Khalil's proposed action was to inspire others to take action for positive change.

One last quote that substantiates the theme activism came when Khalil was asked what his favorite part of the project was,

> The feedback, just the expression on the kids' faces after, you know, hearing music that's not, that you won't hear on the radio, you know, just like more of a positive influence, a message.

Khalil used words like "positive influence" and "a message" to emphasis that his music was more than a something you would "hear on the radio." He talked about how wrote and presented an anthem for a local peacekeeping organization, and he planned to continue to volunteer after graduation. This was significant because it helped increase environmental literacy by providing opportunities for students to encourage peacefulness.

Overall, Khalil's senior thesis YPEAR project exit interview included codes that addressed The purpose of the senior thesis project, creating change in the community and taking action, as it leads to activism, was substantiated by many of the students, including Justin, Jacob and David.

Supporting roles: Justin, Jacob, and David. Six months after Khalil's exit interview, Justin substantiated the code of creating change in the community during the student and staff discussion by recalling the power of one of Khalil's performances,

> You'd see kids dancing and see the people there dancing and see kids getting involved in his music. And you could even see it, even if they weren't of the same race or religion or background as he was, they had a connection at that moment because he did put on this big presentation his action was a meaningful thing because he said this is where I came from, this is what my life looks like and this is how it affects everyone around me.

Justin felt that the action Khalil took was "meaningful" because he was honest about where he came from and his impact on the people around him. This is related to the code change in the community, as Justin felt kids were "getting involved in his music," demonstrating they "had a connection."

Another quote that substantiated the theme of activism came from Jacob during his exit interview when he was asked what his favorite part of his project was,

> When everyone finally got to the road and started biking. Honestly, right when it ended and then we went for our first wellness, I was like, "yes this is perfect, this is exactly how I envisioned it"

The most challenging part of the project for Jacob was waiting through the winter months to get his bike safety workshop started. After the first class, "right when it ended," the group of students went on a bike ride for "wellness." To Jacob, this was "perfect," supporting the theme of activism as he saw a problem in the community and took action to address it. This is significant because it helped develop Jacob's environmental literacy by providing a space where he could practice the skills necessary to propose and justify actions to address environmental issues.

In juxtaposition, David was not as excited about the senior thesis YPEAR project. David, a Latino senior, was only in his fourth month as a student at the school when he participated in the discussion at the strategic planning retreat. Fully bilingual, his senior thesis project, "How does learning science in Spanish affect students' desire to learn and speak science-related content in Spanish?" worked in collaboration with the Latino Earth Partnership for Schools. He was still trying to transition into project-based learning and was just starting to formulate his own plan when he reviewed Angel's poster from the previous year. He began his analysis of Angel's project by stating,

> He did demonstrate what he is talking about, he did what he talked about and he tried to reach the students so they can better themselves and learn about what he's trying to teach them

To David, Angel met all the requirements by demonstrating, doing and trying to reach students. However, when he was asked to clarify if he thought Angel deserved a high score on the rubric, he continued with, "I mean, he got the grant so I guess he was pretty committed to what he was doing." To David, the fact that someone gave Angel money to work on his project was how he measured his success. He did not focus on the action that Angel took, or impact on community, just if he completed the tasks he said he would. When talking about his own project, David said he planned to do what he always did, "I'll just wait 'til the end and throw something together."

This related to the purpose of the project code, as David made it very clear that the purpose for him was to "throw something together" with the hopes to graduate. He was not interested in taking action to create change in his community, which contradicts the theme of activism. This is significant because it demonstrates before the senior thesis YPEAR project can help develop students' environmental literacy, the students must first buy into the senior thesis project. At this point, I wrote a memo where I wondered how many students actually bought-in to the process instead of just went through he motions. Several reflections on the main characters from Act III are presented below.

Researcher's Reaction to Act III

I begin by reflecting on Emily's transformative journey. The *Center for Ecoliteracy's* (2015) "A Systems Perspective" page recommends a shift from focusing on parts to focusing on the whole. Escuela Verde's senior thesis YPEAR project encouraged students to shift from focusing on the sum of parts to grasping connections between

different elements by providing opportunities for students to learn with their community. This, in turn, affected the development of their environmental literacy knowledge, skills, and dispositions, which I have depicted in Figure 4.20 below.

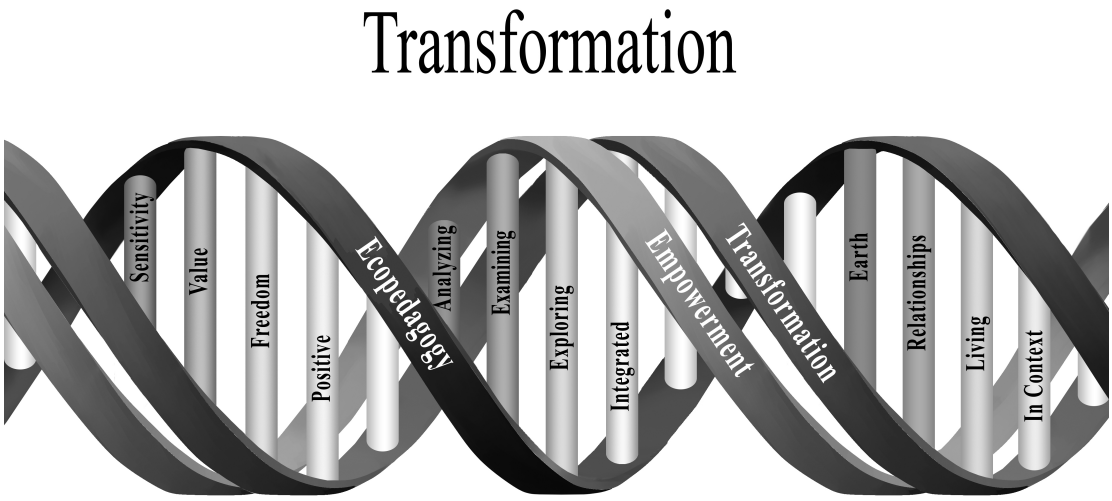

Figure 4.20: *Emily's Transformative Journey.* This DNA graphic presentation of Emily's journey is meant to emphasize the cyclical nature of developing environmental literacy. The rungs of the ladder represent a shift to systems thinking that Emily addressed when talking about her senior thesis YPEAR project leading to the development of specific environmental literacy outcomes.

Once again, "unzip" the double helix and read from left to right. The rungs represent: a specific environmental literacy outcome, a theme, a key topic, and a suggestion for shifting to a systems perspective. The molecule is divided into three sections.

The first section focuses on how Emily gained knowledge that the Earth's identity is essential to the human condition. This environmental literacy outcome was addressed through her stories about living the issue of unhealthy food options with her peers. Emily's journey also demonstrated how her focus shifted from parts to the whole by learning in the context of her natural setting.

The second section focuses on how Emily gained skills analyzing the environmental issue of healthy culturally-relevant food. This environmental literacy outcome became manifest by her experiencing a disorienting dilemma that financial stability may not have been the main issue while exploring reasons for unhealthy food choices. Emily's journey also demonstrated how her focus shifted from parts to the whole through integrating economics and science into a social justice themed project.

The third section focuses on how Emily demonstrated a disposition of sensitivity. This environmental literacy outcome was evident by her discussing how the freedom at the school helped reduce students' anxiety. Emily's journey also demonstrated how her focus shifted from parts to the whole through working to develop a positive culture with the whole school.

Offering opportunities to learn in the natural context while focusing on an integrated curriculum and whole school culture are three ways the *Center for Ecoliteracy* (2015) suggests in order to shift to a systems perspective. This, in turn, is considered a step towards developing environmental literacy. For Emily, this development was demonstrated by her increased knowledge of Earth's identity as essential to the human condition, her improved skills analyzing the environmental issues, and her sensitive disposition.

In reflecting on Jennifer's development of new meaning schemes, I constructed Figure 4.21which uses the *Center for Ecoliteracy's* (2015) core ecological concept of development as a template. The development concept believes that all life changes over time through learning, adapting and coevolving. They provide the example how the

hummingbird and honeysuckle that have changed over time in ways that are mutually beneficial to both organisms, which in turn benefits the ecosystem as a whole.

Figure 4.21: *Jennifer's Development of New Meaning Schemes.* This development graphic presentation of Jennifer's journey is meant to emphasize the learning and developing of environmental literacy. The text on the coils represents themes and specific topics Jennifer addressed when talking about her senior thesis YPEAR project.

This model displays how Jennifer developed specific environmental literacy outcomes through her senior thesis YPEAR project. Specifically, she gained knowledge about the sociopolitical systems involved with consumerism in fashion industry. It also demonstrates how Jennifer gained skills supporting interdependence when she discussed her own on shift from being a bully to speaking up against bullying. Finally, this model depicts how her beliefs and values shifted from a disposition grounded in competitiveness to one of meaningfulness.

Similarly, Figure 4.22, below, uses the *Center for Ecoliteracy's* (2015) core ecological concept of nested systems as a template to present Khalil's experiences with activism. The nested system concept believes that nature is made up of nested systems within systems. Every individual is at the same time an integrated whole and part of a lager system. Changes within any system can impact any or all of the nested systems it is a part of, therefore the sustainability of any system is dependent on the health off all the systems.

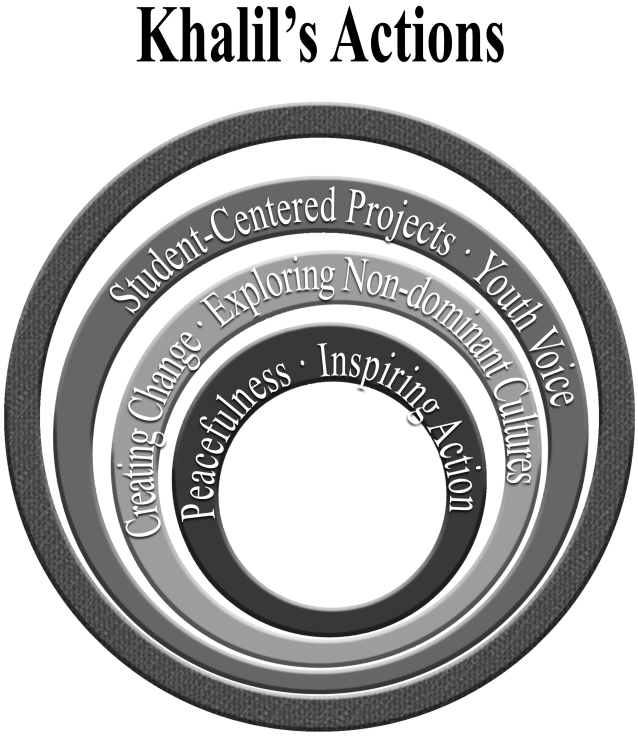

Figure 4.22: *Khalil's Actions.* This nested systems graphic presentation of Khalil's journey is meant to depict how individual systems are part of larger systems. The phrases in the rings represent themes and specific topics Khalil addressed when talking about his senior thesis YPEAR project, and how these helped him develop environmental literacy.

This figure displays how Khalil developed specific environmental literacy outcomes through his senior thesis YPEAR project. Specifically, he gained knowledge of a global perspective by using his student-centered project to share his youth voice about sustainability to other students of similar backgrounds. It also demonstrates how Khalil

gained skills proposing and justifying exploring the non-dominant hip hop culture as a means to create change for a more sustainable community. Finally, this model depicts how he not only intended to act, but took action to promote peacefulness. His hope was his project would inspire other youth to take action as well.

Talk Back Session: Personal Connections

Although the presentation of these findings have been intentionally heavy on the description, Wolcott (1994) suggested the importance of including a connection with personal experiences as an appropriate approach to displaying the interpretation of information. This section provides the reader some insight into the ways in which this research has affected my consciousness, and will help to guide my future research and practice.

Ecopedagogy

Through critical analysis, there were several things that surprised me. First, I was surprised by which students really "got it" and which students did not. By observing on a day-to-day basis, some of the students who appeared only slightly engaged talked in passionate detail about their projects and the impact on the community they were making. On the other hand, some students who appeared to be working at all times didn't really understand the impact they were having. When presenting this study to the staff, this will serve as a good reminder to really listen to our students when they speak to us, and to not make assumptions by their typical behavior.

Another aspect that surprised me was the amount of depth some students reached, and the impact it had on how they perceived their lives. In particular, I was taken aback by Demarco's feeling towards technology. After graduation, he was accepted to college

and planned to go into a computer related field. I was upset with myself for not listening to his exit interview sooner, so that I could have helped him work through the guilt he had built up as he realized the impact technology had on the Earth. Putting this information into practice, it would be beneficial for the advisors to listen to the seniors exit interviews before they leave so we can help them find a place of peace. Additionally, it is important for us to be prepared for those who really "get" the tough topics we discuss and offer ways we can repair the harm. Our restorative justice program currently focuses on personal behaviors, but we may want to explore ways we can collectively repair the harm on a larger scale as well.

Finally, I was surprised by my worrying about rigor as I analyzed the data. Although the students are required to do background knowledge and integrate common core learning targets into their projects, none of them mentioned them in their discussions or interviews. Even though I am well versed in the direction I want to head, it was a good reminder that even I am still on the road to "unlearn" the habits of mind that have been ingrained in me throughout my educational journey. As Antunes and Gadotti (2005) remind us, the classic pedagogies as anthropocentric, whereas, "Eco-pedagogy is based upon a planetary understanding of gender, species, kingdoms, formal, informal, and non-formal education" (p. 136). As a teacher, it will always be important to stress rigor, the next step for our school is to really define how that rigor will look differently.

Empowerment

Several things surprised me while analyzing this section of the data. First, I really took to heart Justin's critique that the project was still very adult-centric. Putting this research to practice, I wonder if the senior thesis YPEAR project could evolve where

students would have the option of the senior thesis or some other capstone project. It appeared to be ineffective for those students who are not engaged anyway, so an alternate may be more relevant to those students' lives.

Related to this, there were a lot of interesting comments about different community organizations approaches to collaborating with our students. Particularly surprising, some students felt the had less of a community impact during the parts of their projects they were working with outside organizations. An interesting trend emerged contrasting organizations with a justice focus, which were more open to helping the students vision come to fruition, versus those with an environmental focus, who tended to be more structured with the programs they offered. Taking this feedback back to the school, it will be important for us to provide some objectives for the organization that go beyond typical content. It may also be worth considering starting each collaboration with the students leading a workshop for the organization to help drive home the concept of empowerment.

Transformation

Empowerment alone is not enough, we must be intentionally reflect on our own culture and society. In particular, as a white urban educator, I needed to accept the fact that my culture is that of an oppressor to the marginalized populations I serve. This can be heartbreaking, and angering, and frustrating but it is a truth that I must accept in order to work toward reaching a critical consciousness with the marginalized populations I serve. There is a lot of research about the high teacher turnover in urban areas. Much of the research focuses on classroom management, and to be considered a highly qualified

teacher is just in a license, yet the discussions with our collective focus heavily on finding our peace.

Our diverse staff is committed to talking about our own journeys in the process, and how we work through the guilt and burdens of the roles we play, yet we often bump this time for other more "pressing" issues. It is assumed that teachers are leaving the profession because they can't handle it, yet I would argue there is a faction of teachers out there who can handle it, but realize the role they are playing as an oppressive power and are intentionally choosing to disengage.

This concept may also prove true for a fraction of our urban high school drop-outs who are not dropping out of high school because they can't do it, but rather because they don't want to be a part of that oppressive system. There is no claim that this type of educational reform is the right fit for everyone, but for those educators and students who have consciously left the educational system, this may be an alternative. At the very least, helping with skills to find peace when realizing we are a part of the problem is key to continuing along with the process.

Conclusion

This chapter provided an empathetic understanding of how participants experienced and interpreted their senior thesis YPEAR projects. It included brief analyses of how this process affected their development of environmental literacy. The findings presented the progression through which students moved through the senior thesis YPEAR projects, instead of focusing on the sum effect. A total of twenty-nine participants were included in this study, however the primary focus was on the twelve seniors and seven alumni who participated.

These findings only provide a snapshot of the extensive amount of data collected. Although every attempt was made to be trustworthy, my relationship with and passion for the project carries unavoidable bias. These findings are not meant to provide a solution to a problem, nor do they claim to be transferable to other situations. I leave it up to the reader to determine how they might use this information.

Chapter Five: The Epilogue

Discussion of Research Findings and Implications for Teachers, Teacher Education, Curriculum Policy, and Future Research

This qualitative case study was guided by the research question how does Youth Participatory Eco-justice Action Research (YPEAR) affect the development of environmental literacy in urban high school students. As a white, female science teacher working in urban classrooms, I am sensitive to the issues of power and privilege that are manifest throughout traditional curriculum. Therefore, the school's curriculum and experiences have been collectively designed to help students consider their relationship with their communities and the Earth. Through student-led project-based learning with an emphasis on sustainable communities and restorative justice, students have the opportunities to practice skills they will need to become active citizens.

Specifically, the YPEAR curricular model was created as a reaction to the misuse of science to promote untruths. It provided opportunities for students to challenge the dominant discourse in science and use their own voices to construct work deemed important to their communities. In this project, students became empowered participants in their own educational journeys.

Likewise, as a white researcher interested in environmental literacy with urban populations, I am sensitive to issues of power and privilege that are often unaddressed in environmental education research, which typically focuses on white, rural populations (Hungerford, 2010; Stapp, 1969). Therefore, the knowledge, skills and dispositions that define environmentally literate individuals have been expanded to include international

and critical perspectives. This includes exploring the notions of ecopedagogy, empowerment and transformation in students' senior thesis YPEAR projects.

Although the findings in this research are not meant to provide *the* answer to a problem, they do provide insight into how this curricular model affects environmental literacy. This chapter explores what the findings mean in relation to the research. It begins by identifying how the YPEAR project embodies the notions of ecopedagogy, empowerment and transformation. Theses terms serve as section markers in this chapter. Each is contextualized under a classic learning theory and then related to environmental literacy. Next, the implications for curriculum policy and student learning and for teachers in urban settings are presented. The chapter closes with suggestions for future research.

The YPEAR Project and Development of Scientific Literacy

YPEAR, Ecopedagogy and Environmental Literacy

To begin, Victoria brought us the idea that it was important to participate *with* art, and pointed out that this practice benefited the whole community, "even the adults." Friere's (1970) critical pedagogy, and later ecopedagogy, supports a shift to a social reconstruction ideology as a means to facilitate the construction of a new and more just society that offers maximum satisfaction to all its members.

Victoria's creation of a collaborative art space as a problem-posing versus banking education as it allowed her to come up with a potential solution to a problem she saw in her community. This shift in ontological approach offered a constructivist alternative to the positivistic view that, "…knowledge is a gift bestowed by those who

consider themselves knowledgeable upon those whom they consider to know nothing" (p. 72).

Her belief that her project helped the adults as well as the students demonstrated how both the adults (oppressors) and students (oppressed) worked together to reflect on their school conditions, imagine them better, and then took collective action to create that positive change. Although not a huge societal change, this opportunity provided practice for Victoria, and the adults, to shift the way they typically thought about the school system and work toward a critical consciousness.

This practice joining together with her peers also helped Victoria feel comfortable and proud of who she was. Through her love of art, she talked about how she was at a real advantage in the world because she figured out who she was at a young age. This sense of identity is another crucial component to Friere's (1970) pedagogy of the oppressed, as he believed, "… Without a sense of identity, there can be no real struggle…" (p. 186).

With respect to the the process of praxis, Justin talked about how understood the power of language, and walked through his thought process about a rap artist using the "n-word." Although Justice saw that this was a popular hook in the music industry, he refused to use it as he felt it was oppressive. He talked about how he used to use it, when he "was a kid," but now he understood what it really meant. Freire (1970) coined this process as praxis, which asserts that, "Functionally, oppression is domesticating. To no longer be prey to its force, one must emerge from it and turn upon it. This can be done only by means of the praxis: reflection and action upon the world in order to transform it"

(p. 51). Justin hoped to use his music and his workshop on racial segregation as a way to transform how the students viewed themselves in relation to the world.

Isabella's views echoed Justin's by comparing the US to a bully. She asserted that Western civilization thought we were the "top dog," yet were "more confused than any other people." Her senior thesis YPEAR project focused on non-Western meditation and peacekeeping trainings in order to help students find what was "most important." When discussing how Western societies influence identity, Freire (1970) believed, "For them, *to be is to have* and to be the class of the "haves . . . they cannot see that, in the egoistic pursuit of *having* as a possessing class, they suffocate in their own possessions and no longer *are*; they merely *have*" (p. 59). Isabella supported this idea of the "haves" when she talked about her beliefs that people were lonely and depressed because they never got what they wanted, and they wanted material things.

Looking back on the YPEAR projects, Freire (1970) would have argued right alongside of Christopher that these projects were still heavily influenced and driven by adults. Christopher believed that students preferred to learn from adults, who were professionals and experts. To him, this top down approach is what students expected and wanted in a workshop. Yet Freire (1970) would argue that, "Leaders who do not act dialogically, but insist on imposing their decisions, do not organize the people they manipulate them. They do not liberate, nor are they liberated: they oppress" (p. 178). Although the students had the freedom to select their own topics and take their own action, the senior thesis YPEAR project is a graduation requirement imposed by the advisor collective. Even so, the senior thesis YPEAR project would be a step closer towards putting Freire's pedagogy of the oppressed to action in a contemporary urban

classroom. This also helped students develop environmental knowledge, skills and dispositions that were relevant to their lives.

Inferences Drawn from YPEAR, Ecopedagogy and Environmental Literacy

Embracing Ecopedagogy: The Impact of EV's Senior Thesis YPEAR Project on Environmental Literacy
YPEAR projects encouraged reflection and provided opportunities to increase: • Sensitivity • Responsibility • Happiness
YPEAR projects offered opportunities to practice: • Evaluating potential solutions to environmental issues • Defending simplicity, care, and peacefulness • Collaborating with the community
YPEAR projects provided opportunities to gain knowledge of and work with: • Physical and ecological systems • Activities supporting healthy emotional and physical choices • A strong sense of place
Supporting Research Ecocentrism (Bowers, 2006; Gadotti, 2010; Hovardas, 2013, Payne, 2010); Significant Life Experiences (Chawla, 2001; Orr, 2002, Palmer, 1999); US Trends (Volk & McBeth, 1997; Sward & Marcinkowski, 2001); New Niches (Lotz-Sisitka, Fien, & Ketlhoilwe, 2013; O'Donoghue & McNaught, 1991); International Research (Aguirre-Bielschowsky, Freeman, & Vass, 2012; O'Donoghue, 2007; Sandell, & Öhman, 2010; UNESCO, 2005, Wals & Alblas, 1997); Critical EE (Prakash, 1995; Robottom, 2005); Planetary conscious (Bell & Russell, 2000; McLaren, 2004; McNaughton, 2010); Ecopedagogy (Antunes, & Gadotti, 2005; Davis, 2013; Gadotti, 2011; Grigorov & Fleuri, 2012; Khan, 2008, 2009, 2010) YPAR (Arnold, 2009; Ballard, & Belsky, 2010; Cammarota & Fine, 2008; Hart, 1997; Jensen & Schnack, 2006; McIntyre, 2008; Torre, 2005).

Table 5.1: *YPEAR, Ecopedagogy and Environmental Literacy.* This table summarizes how the senior thesis YPEAR project affected the development of environmental literacy in Escuela Verde students. Specifically, this table focuses on how embracing an ecopedagogical praxis affected students' dispositions, skills and knowledge related to the environment. Supporting research is also included.

In this study, the senior thesis YPEAR project along with staff adhering to an ecopedagogical praxis helped students acknowledge that our current cultural norms are

not in concert with the natural world. In doing so, they were to actively engage in working for a more just, peaceful, and sustainable planetary community in order to liberate and decolonize the Earth. As such, the YPEAR project's focus on ecopedagogy supported the development of environmental literacy in urban students.

YPEAR, Empowerment, and Environmental Literacy

Traditional curriculum focuses on educating the dominant culture's knowledge and skills, and attempts to standardize this knowledge. Null (2008), however, claimed the axiological underpinnings of school curriculum always referred to an institution whose purpose is to educate, the question remains educate for what? Students, such as Luis, would argue this process doesn't work, and only alienates marginalized populations even further.

Luis reflected on his past experiences with traditional schools as a time he would get "in trouble" because he would "draw too much." For him, drawing was more than something to do to avoid his work, it was his passion and a way to feel like he had a place in his community. Rather than forcing him to focus on other content, the senior thesis YPEAR project allowed him to create a gallery for other students to display and sell their work. Whereas he still needed to focus on other content-specific projects to earn credit necessary for graduation, the YPEAR project gave him something to look forward to during the day as well as time to collaborate with his peers who were interested in expressing knowledge through art.

Dewey (1904/1959), argued for a more holistic epistemological stance to education. He believed that ideas made sense as a whole, and that multiple truths existed and need to be valued. He considered the universe to be "fluid and fluent," and that the

child needed opportunities to explore "the child's own world" (p. 6). Dewey believed an asset-based approach that tapped into students' passions and experiences was the best way for learning to occur, and Luis supported this by creating a YPEAR project that "won't make you *feel* dumb," but rather "boost your confidence."

Dewey also shared a similar axiological view, as considering the values of school was to help students live happy, meaningful lives and this growth was facilitated by choice. The senior thesis YPEAR projects offered opportunities for students to explore their interests as they considered who the wanted to become. In this study, Angel wanted to share his passion and interest in bmx bike riding with his peers. He felt riding bikes really helped students and staff get to know our city, and "be happy."

Students like Khalil reflected with pride and excitement that they had the opportunity to select projects that were meaningful to them. "I mean it was me . . . I picked it. You know, I picked this project!" Khalil boasted when he claimed this was different from any other experience he had ever had in school. This change in ontological underpinnings reflects a shift in the teacher and student relationship related to curriculum, where students had the opportunity to drive their own projects and teachers were there to help them as needed.

Although not all students had the skills or were ready for the responsibility of leading their education, this study suggests time must be set aside to shift to this new paradigm in order to unlearn the dominant truths. Schools must talk openly about power and be willing to take time to allow their students these opportunities. This is particularly important for urban schools who typically represent non-dominant cultures and are rushed into reform after reform without much time to breath in between. Overall, the

senior thesis YPEAR project represents a curricular model based on Dewey's constructivist ideologies to action in a contemporary urban classroom, and helped students develop environmental knowledge, skills and dispositions relevant to their lives.

Inferences Drawn from YPEAR, Empowerment and Environmental Literacy

Empowering Students: The Impact of EV's Senior Thesis YPEAR Project on Environmental Literacy
YPEAR projects encouraged reflection and provided opportunities to increase: • Interests • Locus of control • Thoughtfulness
YPEAR projects offered opportunities to practice: • Identifying environmental issues • Engaging in dignified interactions to flourish without harm • Praxis-researching, taking action, reflecting, and adjusting
YPEAR projects provided opportunities to gain knowledge of and work with: • Environmental issues • Strategies for addressing environmental issues • Feelings
Supporting Research Constructivism (Dewey, 1904/1959; Illich, 1983; Lincoln & Guba, 1985; Vygotsky,1978); PBL (Boaler, 2002; Buck Institute for Education, 2013; Newell, 2003; Penuel & Means, 2000); Curriculum theory (Gress, 2002; Joseph, 2011; Null, 2008; Schiro, 2008); Poverty and Science (Hsu, 2009; Laughter & Adams, 2012; Santos, 2008); Urban voice and dialogue (Cipolle, 2010; Dimitriadis, 2005; Fleer, 2009, Schultz, 2008); Feminist perspective (Gough, 1999; Prakash, 2010); (Apple, 2004; Boaler, 2002; Ladson-Billings, 1994); Critical science education (Roth & Barton, 2004, Wals, 2007).

Table 5.2: *YPEAR, Empowerment and Environmental Literacy.* This table summarizes how the senior thesis YPEAR project affected the development of environmental literacy in Escuela Verde students. Specifically, this table focuses on how empowerment affected students' dispositions, skills and knowledge related to the environment. Supporting research is also included.

In this study, the senior thesis YPEAR project empowered students to develop a critical human consciousness. It also provided opportunities for their work to be grounded in collective discourse through dignified interactions from multiple

perspectives, rather than competition. In doing so, it helped foster the development of environmental literacy in urban students.

YPEAR, Transformation, and Environmental Literacy

Mezirow (1994) defined transformative learning as "the social process of construing and appropriating a new or revised interpretation of the meaning of one's experience as a guide to action," (p. 222-3). The learning theory also describes how learners built new meaning structures when new knowledge or experiences presented themselves. He would consider Escuela Verde a transformative space for students, staff, community volunteers to revisit meanings and take action for change. Specifically, the senior thesis YPEAR project, as a curricular model, provided opportunities for students to practice transforming themselves, the school and the community. It also helped students find value in school.

Several students talked about how they didn't use to see the value of school, and used to just act up or skip. However, the value of school also shifted for those who were traditionally "good" students.

Emily reflected on her previous project-based school experiences, and commented that although she always got good grades, "it was hard to do what I wanted" and she still "had a lot of restrictions." For her, these restrictions made the previous school not as fun, nor "effective." After making the transition to EV and completing the senior thesis YPEAR project, Emily saw the value of exploring issues she was living, rather than simply going through the motions. These statements illustrate Mezirow's (1997) belief that critical and autonomous thinking must take precedence over the uncritical

assimilation of knowledge. Transformative learning is a route to the development of critical thinking (p. 9).

Khalil also used his senior thesis YPEAR project to critically reflect on what helped him change, and share that with his peers. Unlike Emily, Khalil did not have success at his previous school and he talked openly about struggling with drugs and getting into negative situations. However, like Emily, he was "living the issue" he chose for his project and used phrases like "they wanted to fight" and "there was a lot of oppression" to compare situations in "south Bronx" with Milwaukee. He acknowledged that hip hop culture helped him get through "rough times," and he wanted to help his peers by keeping "that cycle going."

Here, we see Khalil's perspective transformation, which Mezirow (1990) suggests,

> A process of becoming critically aware of how and why our presuppositions have come to constrain the way we perceive, understand, and feel about our world; changing these structures of habitual expectations to make possible a more inclusive, discriminating, and integrating perspective; and finally, making choices or otherwise acting upon these new understandings (p.14).

Khalil found support from a local non-profit that helped him get on track, and used his knowledge, skills and dispositions to inspire others to follow his footsteps through his YPEAR project. Other students experienced what Mezirow (1990) coined a disorienting dilemma during their project. For example, Ashley realized it wasn't her artistic ability, but rather the students' confidence through her encouragement that made their mural "a great outcome." This was significant as she went through a disorienting dilemma when trying to figure out her leadership style, which resulted in a new frame of reference for her. Mezirow (1997) would argue it that the validation of these new

meanings completed the process and created new lenses from which these students viewed and made sense of their worlds.

However, students such as Mia believed the senior thesis YPEAR project was "just too much," and it may be simply adding one more obstacle to urban students' lives. When Taylor (1997) reviewed the thirty-nine published studies that followed Mezirow's introduction of transformative learning theory, only four were in educational settings and none were in the context of urban settings. Some would argue with Mia, that the barrage of disorienting dilemmas for urban learners made the promotion of transformative learning too much. Daley, Fisher, and Martin (2000) claimed individuals living in the central city often had a "split identity," because they live in what they call discourse communities, which are formed from the relationships the individual has with various aspects of their environment, such as family, relationships, work, church, and schools, through which the individual navigates.

Nonetheless, EV's senior thesis YPEAR project was implemented in an urban school and students interviewed expressed positive feelings towards it. This project helped students become autonomous, responsible thinkers. To Mezirow (1997), autonomy refers to,

> The understanding, skills, and dispositions necessary to become critically reflective of one's own assumptions and to engage effectively in discourse to validate one's beliefs through the experiences of others who share universal values (p. 9).

Considering this, embracing Mezirow's transformative learning theory also helped students develop environmental knowledge, skills and dispositions that were relevant to their lives.

Inferences Drawn from YPEAR, Transformation and Environmental Literacy

Transformative Spaces: The Impact of EV's Senior Thesis YPEAR Project on Environmental Literacy
YPEAR projects encouraged reflection and provided opportunities to increase: • Sensitivity • Meaningfulness • Intentions to act
YPEAR projects offered opportunities to practice: • Analyzing critical reflection • Proposing and justifying actions to address environmental issues • Supporting interdependence
YPEAR projects provided opportunities to gain knowledge of and work with: • Sociopolitical systems • Global perspective • The Earth's identity as essential to human condition
Supporting Research Social reconstructivism (Freire, 2005; Giroux, 2001; Greene, 2000; Illich, 1983; Ladson-Billings & Brown, 2008); Hidden curriculum (Anyon, 1980; Apple, 1995; Valenzuela, 1999); Mis-education (Chomsky & Macedo, 2000; Woodson, 1933); School to Prison pipeline (Christle, 2005; Kozol, 1992); Social Justice and Science (Barton, Ermer, Burkett, & Osborne, 2003; Bullard, 1993); White Teachers & Critical Consciousness (Freire, 2005; Cipolle, 2010) CRP(Ladson-Billings, 1994; Sleeter, 2012); Care (Noddings, 1984); Power and Climate Change; (Kenis, & Mathijs, 2012; Martusewicz, Edmundson, & Lupinacci, 2011); Intercultural Approaches (Agyeman, 2005; Prakash, Stuchul, & Madhu, 2005); Decolonizing Methodologies and Youth Activism (Ginwright, Noguera, & Cammarota, 2006; Smith, 2012; Stovall, 2004; Wise, & Fine, 2004).

Table 5.3: *YPEAR, Transformation and Environmental Literacy.* This table summarizes how the senior thesis YPEAR project affected the development of environmental literacy in Escuela Verde students. Specifically, this table focuses on how transformative practices affected students' dispositions, skills and knowledge related to the environment. Supporting research is also included.

In this study, the senior thesis YPEAR project helped students transform their identity to someone who is an oppressor of the Earth. They not only acknowledge that our current cultural norms are not in concert with the natural world, but actively engage in working for a more just, peaceful, and sustainable planetary community in order to

liberate and decolonize the Earth. This transformative process helped foster students' environmental literacy.

Implications for Curriculum Policy and Student Learning

The findings from this qualitative exploratory case study offer several implications for student learning and curriculum policy for urban settings. These implications include intentionally living with each other and the Earth, modeling and supporting collaborative efforts, and reevaluating the value of urban schools.

Planetary Citizenship: Intentionally Living with Each Other and the Earth

In the very first issue of *Environmental Education*, Stapp's (1969) seminal article stressed the importance of an educated citizenry. In fact, he claimed it was vital that, "the citizenry be knowledgeable concerning their biophysical environment and associated problems, aware of how they can help solve these problems, and motivated to work toward effective solutions." (p 30). Mika's senior thesis YPEAR project exemplified this, as she used "repurpose materials" and "sustainable food" to create a living green wall for the school and lead workshops for students and staff about composting and thinking about how food systems impact the Earth.

The implication this has on curricular policy is that it demonstrates a student-centered project that was driven by the student and still met the desired curricular objectives set by both the student and staff. The curricular YPEAR approach was important to the field of EE because Stapp (1969) argued, "few programs emphasize the role of the citizen in working, both individually and collectively, toward the solution of problems that affect our well being. There is a vital need for an educational approach that effectively educates man regarding his relationship to the total environment," (p 30).

Although much time has passed, there still remain few examples of curricular models that allow students to learn about environmental aspects they are interested in, particularly with urban populations. Nearly fifty years ago, Stapp (1969) predicted we would need to make EE relevant to urban populations,

> In rural surroundings, direct daily contact with the basic natural resources was prevalent, especially within man's immediate environment. As man became progressively urbanized, his intimate association and interaction with natural resources diminished and, with it his awareness of his dependency on them, (p 30).

Nonetheless, the majority of EE research has been done with predominantly white, rural populations. Sivek (2002), argued that environmental sensitivity (ES) was a precursor to environmental literacy, and noted, "Neither urban students nor non-white students (with two exceptions) were assessed in this study" (p.159) of the 1998 Wisconsin High School Environmental Action Conference.

This study provides an example of EE being implemented with an urban population and argues we must be intentional about including marginalized populations in our research and curriculum design if we plan to create environmentally just communities. Rather than bringing urban youth to sustainability, we need to bring sustainability to urban youth. One example from this research was provided by Justin who wrote hip hop music with lyrics that focused on sustainability. He claimed he and his fellow musicians were were "changing the world" through what he called "wordplay," with lyrics such as, *We're swapping knowledge with the toys in your kid meals.* If we want to make EE relevant to urban youth, we must provide avenues they are used to and passionate about.

Another issue curriculum policy makers need to consider is the goal of EE. If the goal is to create environmental leaders who exhibit pro-environmental behaviors, then we need to look beyond the "good students." Building on the significant life experiences research, Arnold's (2009) qualitative research focused on youth and environmental action and found that "being a successful student does not seem to be a prerequisite to environmental leadership" (p.28). Many of the seniors interviewed would be considered young environmental leaders, however most of them were not considered "good students" at traditional schools.

Whereas this research addressed the "good student," issue, there is still a gap in culturally-relevant EE. Arnold (2009) admits, "One significant limitation of the present study was the homogeneous sample. All participants were White, none came from low-income backgrounds, and most were female," (p.34). She continued to explain that this group was reflective of her 20 years worth of research in Nova Scotia, where youth involved in EE positions were almost always white and two-thirds were female. She ended by suggested future research needed investigate the experiences of young leaders who were culturally and economically more diverse (p. 34). This study provided that population.

Yet, in order to work with young leaders who are culturally and economically more diverse, the curriculum must be presented in such a way that is relevant to their lives. This finding contradicts that of Hashimoto-Martell et al's (2012) whose research studying the impact of an urban ecology course found that, although there were gains in scientific learning, there was still a disconnect between the content and relevance of the environment to the students' own lives.

Finally, if we want our urban students to be truly engaged in their learning, we should allow them to contribute to educational research through Youth Participatory Action Research (YPAR). Gruenewald (2004) argues that the institutionalization of EE has been counterproductive to the socially and ecologically transformative goals and recommended a tradition that included both ecological and social perspectives and supported the Earth Charter as a socioecological, visionary text. The research in this study strongly encourages curricular policy makers to look beyond US curricular models, such as the Earth Charter, to guide them as they attempt to become a global citizens. Youth Participatory Action Research (YPAR) is one method encouraged by the Earth Charter.

Modeling Collaboration to Disrupt Existing Power Relationships

Another implication this study has for curriculum policy makers is to create models of teaching and learning that shift from competition to collaboration. One way to accomplish this is through rubrics versus grades, such as the senior thesis YPEAR rubric. Seniors worked with staff to collaboratively create the rubric and decide how many points were necessary in order to graduate. If they didn't meet the required points, students did not fail, but rather had to make adjustments until they earned enough points to graduate.

Additionally, the YPEAR curricular model was designed and implemented by a teacher collective. Students learned and observed how advisors shared teaching and administrative duties, and worked collaboratively to help the school function. Advisors were also intentional about including time for students to make decisions about their school through daily advisories and monthly town hall meetings. Several students used a

similar format when running their workshops. In fact, as Ashley (one of the students) pointed, she "sat back a little" and "was really following their lead." So although she was in control, she intentionally gave power back to the students in her workshop as they created a mural for her YPEAR project.

Wals and Albas's (1997) research supports collaboration as a necessary means to school reform. They found that,

> A main research presupposition is that if a school wants to realize educational change then it is of crucial importance that all actors involved jointly assess and define the situation the school is in, how it arrived at that situation, the imagined outcome of the educational change process and the route that could transform the present situation into a more desirable one (Robottom, 1987; Elliott, 1991, 1993; Wals, 1993; Hart, 1996) (p. 255).

Although most educational policy is created from the top down, this study offers portraits of how urban youth were a valuable asset in the reform process. Khalil discussed how many of his projects "gave back" to the community, and the majority of the students took the responsibility of taking action to help their communities seriously. Such behaviors drew on the code of thoughtfulness where students think about where and who they want to be and take action to get there. Jennifer also talked about how she realized that she had power and that "people looked up to" her and her friend, together they decided to "give them the help that they need." As Hungerford and Volk (1990) point out, "Since the 1980s, a different path for environmental education has emerged aiming at children's participation and emancipation, not only through the transfer of knowledge but also through ownership and empowerment variables (e.g., in the US, Hungerford, Peyton, and Wilke 1980, 1983; Hungerford and Volk 1990)," (p. 54). This study offers evidence of how the YPEAR project found a way to make EE relevant to urban youth.

One way the YPEAR project accomplishes this was by integrating culturally relevant pedagogy (CRP) into the EE curriculum. The senior thesis YPEAR project attempted to integrate characteristics of CRP with EE issues. Although there has not been studies used specifically with EE and CRP, building on Ladson-Billing's (1995, 2006) conception of culturally relevant pedagogy, Laughter and Adam's (2012) study found "students willing and able to wrestle with scientific content in personally relevant ways, students who came to see science as a system of knowing with its own benefits and limitations that can be employed to different ends," (p. 1129).

Integrating CRP into science education is an example of an, "Emerging line of science education research that examines the teaching of science as an issue of civil rights and social justice (Tate, 2001), seeking to use science as a means to transform oppressive conditions in society (Santos, 2008)," (p. 1108). This shift is particularly important when working with urban populations, but would also be a valuable model for all schools when considering the Earth as a marginalized population. We must prioritize collaborating with each other and the Earth in order to change our oppressive behaviors.

Reevaluating the Value of Urban Schools

This research also has implications for reevaluating the value of urban schools by considering the value of critical EE as a means to create sustainable communities. As Mezirow (1997) noted, "The learner's immediate objectives may be described in terms of subject matter mastery, attainment of specific competencies, or other job-related objectives, but his or her goal is to become a socially responsible autonomous thinker" (p. 8). Urban educators are often forced to focus on immediate short-term goals, when they have diversity and resiliency to create long-term change. In this study, Jennifer started

out with a short-term objective of completing her project and picked a subject she thought she could finish. However, she described the point when she "really thought about it," and she remembered how much she enjoyed a tie-dye workshop she participated with through at an outside community organization. She considered how that would be something the students at the school would really benefit from, and how her project shifted from just a requirement to a project she felt more connected to. Allowing students the time to come to their own conclusions is part of critical pedagogy.

Aguirre-Bielschowsky et.al. (2012) believes EE could be improved by including a critical perspective because it would help students of a low socio-economic level take a more active approach to their local environments.

Aguirre-Bielschowsky et. al.'s (2012) study provided evidence that supports a shift from a consumerist lifestyle to living simply though continued contact with nature. That work suggests, place-based education as well as an honest discussion about how our values affect the planet. This study also found that although students were in general aware of environmental problems, they did not take a critical look at how the socio-economic structure impacted the environment. Addressing critical issues in EE (eg. discussing how issues of environmental racism or consumer issues have a greater impact on lower socio-economic groups) will help to develop a new paradigm that respects nature.

Urban youth need to have the time and opportunities to explore issues and take action for change in their own communities. Providing opportunities for students to create curriculum and policies with principals and other school leaders will help offset the institutionalization of EE has been counterproductive to the socially and ecologically

transformative goals (Gruenewald, 2004). Justin's comments substantiate this when he drew the conclusion that telling someone what you have "read about in books" is not going to help them improve their "understanding of it." Policy makers should allow those who are "living it" the power to transform it into what they feel is best for the population.

Implications for Teachers in Urban Settings

When Lucas started his senior thesis YPEAR project, he thought it was going to be about writing music. However, when interviewed mid-year, he realized it was, "basically about expressing yourself through music, and learning how to collaborate with other people and help them." His focus shifted from the content to relationship building, and this shift is the biggest implication for teachers in urban settings. Particularly true for white secondary teachers whose pre- and in-service training typically focuses on content related pedagogy, it is important to understand how much of it will be ineffective if you do not first address issues of race and power to build relationships with your students, which first involves understanding yourself.

Know Yourself

The steps to become a high school teacher typically include earning a college degree in a specific subject area, taking the appropriate courses to learn how to teach that content, passing teacher-related tests and student teaching. Much of these steps can be accomplished without the candidate ever being challenged to critically reflect on why they wanted to become a teacher, or what they think the goal of teaching was. This is particularly complicated when the majority high school teachers are white, and female and urban populations are not. The layers of complexities increase when the subject matter is perceived as objective, such as math and science.

It is these complexities that make it imperative to take time to critically reflect beyond writing lesson plans and transmitting knowledge in order to become successful teachers. Ye, Varelas and Guajardo's (2011) research concluded,

> Honest, strong, and enduring relationships are not possible unless people examine who they are and want to become relative to others, where they belong or want to belong, and what communities they are members of or want access to, issues deeply associated with cultural consciousness. As these emphases, these cores of educators' identities, morph, it is difficult for other tenets of culturally relevant pedagogy to come to the front (p. 873).

This conclusion mirrors Ladson-Billings (1995) work that pre- and in-service teachers "unearth and document ways in which [their] identities, culturally relevant pedagogy, and urban schools intersect and interact with each other," (Ye, Varelas and Guajardo's, 2011, p. 873).

One way to do this is through Pinar's (2002) concept of currere. Through Pinar's currere, students are given a framework to reflect on their own educational experiences that ultimately shape an individual's self-identity in relationship with society (2002). The student drives the learning, and through "this turning inward, the process of individuation, is change of consciousness. A shift in the source of behavior signals a shift in the behavior itself" (p. 487). It is crucial for teachers to understand their own journey before they can help guide students by authentically caring.

Authentically Care and Listen to Counternarratives

The theme of care emerged in this research as a component of ecopedagogy. Drawing on Noddings' (1992), care theory is based on the idea that two parties *authentically* care for each other.

> I reject the notion that the formal study of history will make better citizens or policy makers who will not repeat the mistakes of the past. What children need to learn is how to sympathize and empathize with other people and to understand their own inclinations toward cruelty and violence (p. 55).

For teachers, this suggests we must dedicate time in our classrooms to get to know our students, and allow them to get to know each other. We must address issues of oppressor/oppression and be intentional with our actions and lessons taught. Friere's (1970) problem-posing education offers an alternate form of education with a focus on the process rather than the product. This is particularly challenging in urban classrooms with high density, high stakes testing and high pressure to help students gain proficiency in their subject content. However, if we are not intentional about setting time aside to build a culture of caring, students will continue to find school a place they would rather not be. From an environmental standpoint, we must first learn to care for ourselves and for each other before we can care for our Earth. One way we can care about each other is to intentionally learn about different cultural perspectives through counternarratives.

As teachers, we must shift our role from experts sharing wisdom to members of a learning community. This is particularly true for white educators in urban classrooms, as the dominant culture needs to listen and empower rather than tell and control. Energy is often spent during pre- and in-service training on classroom management techniques through behavioristic modification. However, if this time was dedicated to listening to counternarratives, the culture that could be created would be more effective long-term classroom management tool.

In Delgado's (1989) seminal piece, ''A Plea for Narrative,'' he argued that the power of the dominant narrative tempts, ''…us to believe that the way things are is

inevitable'' (p. 2417). Delgado argued that the narratives of the oppressed have the potential to subvert, destabilize, and challenge the ''official narrative.'' A counternarrative is one that functions to disrupt the normality of the dominant paradigm—demonstrating alternative interpretations and realities are possible while adjusting the future direction of the overall narrative. Although a common methodological approach used by many Critical Race Theory scholars (Aguirre, 2000; Solorzano and Yosso, 2001), counternarratives can be used to highlight alternative realities are possible with urban high school students.

Consider Demarco's realization of the depth involved in using technology to study nature. Although his senior thesis YPEAR project focused on using GPS to track natural phenomenon such as bat movement, his conclusion at the end of the year looked at the whole picture. He felt that although he learned something about the animals, the development of the technology itself often "destroys the planet" through mining and factories. Considering many African-American stereotypes portray the population as unruly, the conclusion drawn by Demarco may have been considered sarcastic response (Ladson-billings, 1995, 2008; Noguera, 2003; Stovall, 2004). However, because time was spent getting to know the student and listening to their point of view, the interpretation was that he really was digging into the depth of the situation. Being able to look at the global perspective of our actions is a huge step in becoming environmentally literate.

Cabrera, Meza, Romero, & Rodríguez's (2013) counternarrative demonstrated how youth in Tucson were not only critically empowered and engaged in their education,

> But they have the imagination and dedication to lead a community effort to create alternative education when the school system fails them. This is specifically how counternarrative should function, to bring the voices of the marginalized to the forefront (p. 20).

These counternarratives not only disrupt the common sense of hegemonic educational practices, but also, highlight that alternative realities are possible. (p. 8-9). However, opportunities to produce and listen to the counternarratives are not an option without healthy communication in the classroom. One way to accomplish this is through participatory dialogue.

Practice Participatory Dialogue and Embrace Praxis

Freire (1970) believed that both participatory dialogue and praxis were possible effective pedagogical tools to work with oppressed populations. He coined the idea of horizontal conversations as a means to visualize the sharing of power to discuss a shared purpose and vision. Through their UN publication *Participatory Dialogue: Towards a Stable, Safe and Just Society for All,* Hemmati and Tagashira (2007) described how this might look for teachers as leaders who need to move away from the leaders lead and followers follow concept. Instead, they believe "the emergence of "servant", "facilitative", or "collaborative leadership" has contributed to a shift in orientation, namely, to an orientation of leaders as serving the needs of followers so that the followers are in fact the leaders." (p. 27).

It is important for teachers to take the time to work with students toward a collective vision so that the students feel like they are in charge of leading their own educational journeys. Jennifer's responses supported this idea, and were clear when by the laughter in the interview as she described how she had been resistant to the "pushing," from advisors, but was grateful for it. Cabrera, Meza, Romero and Rodriguez's (2013) research supported giving a voice to urban students,

> From the perspective of urban education, this means that youth should be represented when educational decisions are being made that affect their lives. We do not want to idealize the youth perspective, but rather to highlight that they should have a seat at the table. After all, it is their education we are all discussing (p. 21).

This idea involves changing the ontological underpinnings in the transmission of knowledge, and will also take time to practice and adjust. This is where teachers must embrace the idea of praxis, so that they can take research a new idea, action for change, reflect, and adjust. Change can be uncomfortable, but it is necessary if the goal to help create change for a more just community. Rather than waiting to "get good" at teaching, it is important to continuously explore new options and get comfortable with the change. Walker's (1997) describes this praxis as,

> Approaches to research, curriculum development and professional development that are informed by critical theory are mediated by processes of "praxis," or critical reflection on practice. Such approaches can only proceed if there is a dialectical relationship between theory and practice, knowledge and action, in which the practitioner's or researcher's theorizing is at once the topic of, and informed by, his/her educational practices (p. 69).

Not only does this process help create better teachers, but it also models the process for students. During Angel's end of the year reflection, he talked about how this school felt safe and was a place he was excited to go to compared to schools he attended in the past. He mentioned watching his teachers try new things with the students as a way he trusted them. This is important as it demonstrated that students are not as concerned with teachers being "right" with their content as they are being in the job for the "right" reason. This will involve both participatory dialogue with students and taking risks to work towards a curriculum that fits.

Hemmati and Tagashira (2007) believe "The ultimate vision of a well-functioning participatory dialogue process would reveal the group in dialogue assuming a leadership role in and by itself by engaging in the kind of social relations that demonstrate and further social integration" (p. 27). Once again, it is important for pre- and in-service teachers to have the time to not only learn about these methods, but to practice them. This means that professors must also practice participatory dialogue, model praxis and work for social and environmental justice if students are to gain comfort in the process.

Work for Social and Environmental Justice

Urban teachers must also be open to learning. In this study, Khalil used his senior thesis YPEAR project to "perfect his craft." He wanted to model taking action in hopes that teens who were "afraid that they can't make a change" or "don't know that they have the voice to make a change," would be inspired to act themselves. Khalil's craft was hip hop music and spoken word, and although not every student had that skill, his passion and commitment was inspirational and there was definitely a small group who embraced hip hop culture.

Emdin (2012) suggests,

> Hip-hop, a culture with roots in alienation from an existing mold, offers a space of solace for students who are not allowed to participate fully in schools. In other words, when students feel alienated from school or from science, they often respond by deeply affiliating themselves with hip-hop culture (p. 2).

I am not suggesting teachers should take on the characteristics of the culture they are teaching, but they can have meaningful discussions around content and culture with their students. For example, many urban students feel a loss of agency in traditional school settings. This is particularly true for science classrooms that focus on objective

truths (Emdin, 2012; Turner, 2013). In many cases, it may be necessary to rethink the general consensus of the larger scholarly community in order to make the content relevant to the general consensus of the culture of the classroom population.

Turner (2013) recommends educators take a "critical pedagogical approach to hip hop language and literacy practices and engage youth in thinking about their own language, communities, and the media in increasingly critical/social justice-oriented ways" (p. 342). This, he suggests, requires

> (1) the use of youth participatory action research (YPAR), (2) the synthesis of data from the research project, which allowed students to theorize about the data in relationship to their lives, their school, and community, and (3) the creation of a dialectical space for students to marry their new understanding of social justice issues with their hip hop production (p. 346).

When considering the pre- and in-service training for new teachers, there must be opportunities for teachers to talk about different cultural truths in relation to content specific standards. The focus must shift from outcomes to the learning process, as the outcomes should be different for each student if they are truly making the learning relevant to their lives. To do this, teachers need to critically reflect on what and how they are teaching and how both interface with the community they teach.

Model Happy and Healthy Living in the Community

As Moscovici's (2009) research found,

> Science teaching using inquiry methodologies will be successful when prepared students become engaged in science learning under the leadership of a well-prepared science teacher in a safe and well-supported environment. The support is going to involve elements from the school, community, district, credential program, and state, with all the participants sharing autonomy and responsibility for the end result: urban students who like science, know how to solve scientific inquiries, and understand the role of science in our society, (p. 102).

Typically, scientific pedagogical courses provide examples of quality inquiry-based science activities to create well-prepared science teachers, but rarely spend time teaching these science teachers how to create a safe and well-supported environment. To most science pre- and in-service trainers, preparing a safe environment deals with precautionary items such as an eye-wash station and locking up chemicals.

We must, however, also include the social aspects of safety if we want our urban youth to feel empowered to learn. This includes being excited to see the students, modeling asking questions and having the dispositions we are seeking. Whereas all the seniors were earning credits using the common core learning targets and the next generation science standards and all the teachers at the school were certified teachers, the students never mentioned how "smart" the teachers were. They did, however, mention how safe and supported they felt on a regular basis. Jennifer reminded us that, "all the staff here they just kept pushing me and just made me like, a young adult and mature in a lot of ways and just become that positive role model." This pushing was possible because Jennifer trusted that the staff believed in her.

Much of this community feel came from the fact that the majority of the staff lived in the same neighborhoods as the students at the school. Their residency helps them "have an awareness and understanding of their community and its associated problems," which is difficult to do as an outsider (Stapp, 1969, p. 30). In this study, their residency allowed them to be actively engaged in the community, which in turn helped students find partners for their senior thesis YPEAR projects.

Suggestions for Future Research

This exploratory case study yielded some response to the research question how does Youth Participatory Eco-Justice Action Research (YPEAR) affect the development of environmental literacy in urban high school students. But it also generated future questions requiring additional research. For example, the theory of ecopedagogy could benefit from additional research, particularly as it relates to teaching and learning in urban schools. Personally, I plan to explore how this research fits with other organizations that are working with YPAR and ecopedagogy with youth around the world, such as Practicing Freedom and the Earth Charter. I also plan to work with a fellow advisor who is fluent in Portuguese to help translate some original ecopedagogical text to help us relate it to our work.

Second, as an openly gay teacher for the past fifteen years, I bring a unique perspective to the field. I am also interested in learning how this work could be translated through the lens of queer theory. This is interesting for two reasons, first the US contemporary issues surrounding the LGBTQ community as it relates to our urban youth. Second, several student projects had to do with LGBTQ issues although none were part of this study.

A third area for future research involves exploring how ethnography, counternarratives, mixed methods and photovoice, as methodologies might help students explore their research preferences. Finally, future research might also examine how Youth Participatory Eco-justice Action Research (YPEAR) affects the development of environmental literacy in urban high school teachers, suburban high school students, or

rural middle school teachers. Environmental literacy is needed across populations if we are to address the planetary crisis.

Final Commentary

Without hesitation, what is most exciting for me is the idea of helping students share their YPEAR projects with the greater academic research community. Rather than focusing on my own research agendas, I plan to use my skills to help marginalized youth do research on issues they are passionate about. This would add to Wals and Alblas' (1997) qualitative action research-based case study on educational research and development. Their research offered an alternative to the traditional, behaviorist approach to environmental education.

> We argue that given the nature of education and the nature of the environmental crisis, and given the non-prescriptive role environmental education should play in stimulating and shaping educational change, it is appropriate to use research approaches that do not distort communication by manipulation and control. Instead, methods of inquiry are needed which will allow those who are affected by education and educational change to express their ideas and which enable them to determine what changes they themselves find necessary, (p. 255).

As a white, female science teacher and researcher working in urban classrooms, I am sensitive to the issues of power and privilege that are manifest throughout traditional curriculum and educational research. I am drawn to the idea of helping guide my students to use their knowledge, skills and dispositions to become actively engaged citizens working to dismantle dominant discourses to address issues they continue to be passionate about.

Freire (1970) supported the notion that we are moving regardless, and we are either moving to keep the dominant paradigm or to transform it. What better catalyst for change than our urban youth, who are already fueled by being marginalized? Emdin's

(2009) research found, “These students eagerly await opportunities to exercise this power in the creation of a foreseeable new future that is different from an oppressive present” (p. 242). Whereas not all students may be ready for this, Khalil summed up his senior thesis YPEAR project interview with, “This has been the best experience of my life.” I echo Khalil’s statement.

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APPENDIX A: Education for Sustainability Advisory Themes

Sense of Place & Healthy Commons

- Recognize and value the interrelationships between the social, economic, ecological, and architectural history of the community as well as the vital importance of the Commons on our lives and our future .
- Understand your role in caring for the Commons and how to contribute to its continuous health.

Inventing & Affecting the Future: Locus of Control and Consequential Thinking

- Design, implement, and assess actions in service of your individual and collective visions.
- Understand the vital role of vision, imagination, and intention in creating your desired future.

Multiple Perspectives: Cultural Preservation and Transformation

- Know, understand, value, and draw from multiple perspectives in order to co-create shared and evolving visions and actions in the service of a healthy and sustainable future locally and globally
- Advocate for the preservation of cultural histories and heritages.

Natural Laws & Ecological Principles

- Demonstrate awareness of the importance of a great diversity of life (biodiversity) to the long-term sustainability of humankind and other living species on Earth.
- Explain how you are interdependent with others, all living things and natural systems.

Responsible Local & Global Citizenship

- Know and understand the rights, responsibilities, and actions associated with leadership and participation toward healthy and sustainable communities.
- Take action by leading and/or participating in activities leading toward healthy and sustainable communities.

Empathy, Gratitude and Hope

- Imagine yourself in another's place and understand the other's feelings, desires, ideas, and actions, while feeling grateful for what you have.
- Clearly define your goals, develop the specific strategies to reach those goals, and initiate and sustain the activities in support of those strategies.

Social Justice & Fair Distribution

- Know and understand the theory and practice of economics that integrates the economic and social systems with the ecological systems required to support and maintain life on the planet.
- Recognize how the inequalities of local and global wealth have impacted communities and explore ways to close the gap.

Systems Thinking

- Apply systems concepts to your life and understand how your choices will affect our future
- Know and understand the dynamic nature of complex systems and change over time.

APPENDIX B: Writing objectives and unit plans using EV's curricular lenses, sustainability themes and action research approach

1. Determine what lens you plan to use: Ecological, Justice, or Peace
- If this is for a quarterly advisory workshop, use the curriculum planner to determine which lens is featured this quarter
- If this is for a workshop, use the lens best associated with the workshop

2. Determine what Education for Sustainability (EfS) theme you plan to use.
- If this is for a quarterly advisory workshop, use the curriculum planner to determine which theme is featured this quarter
- If this is for a workshop, use the lens best associated with the workshop

3. Use the objective writing guide to write the objective using both the curricular lens and sustainability theme.
- Ecological: Understand and participate in citizen science ecological research to create a more sustainable community with a focus on (enter sustainability theme here).
- Justice: Take action for a more sustainable community with a focus on (enter sustainability theme here).
- Peace: Practice peacekeeping strategies to create a more sustainable community with a focus on (enter sustainability theme here).

4. Use your objective and idea to create an essential or driving question for this unit.

5. Use the 6 phases of quality action research to plan your unit
- If this is for a quarterly advisory or yearlong workshop, integrate all 6 phases into your unit plan
- If this is for a shorter workshop, select one phase to focus on.

6. Suggest three options for your final products.
- If this is for a quarterly advisory or yearlong workshop, include a presentation at our Town Hall Forum
- If this is a yearlong workshop, include a presentation at a Presentation Night.
- Always include individual and group products, with a goal of moving towards interdependence.

7. Use the Buck Institute's Project Planner template to complete your unit plan: http://bie.org/project_planner
- Export and save in the Curriculum Folder on the server
- Add any documents or sources you use that may be useful to future projects

APPENDIX C: Senior Thesis YPEAR Project Guidelines

6 Phases

- Logistical Background Information
- Research Interests & Investigation
- Action Planning & Research Methodology
- Action & Data Collection
- Analysis & Reflection
- Presentation, Demonstration & Celebration

Logistical Background Information (approximately 10 hours)

- What credits do you need to graduate?
- What are you passionate about?
- Write a quality paragraph describing your past experiences with your passion.
- How can your passions tie into your credit needs?
- List 3-5 community resources (people, organizations, businesses) that can help you with your project.
- What sustainability theme does your project tie into most directly? Choose one and describe.
- What is a need in the community that your project will address?
- What is a first draft of a research question you might ask?
- What are 3 types of qualitative data you could collect?
- What are 3 types of quantitative data you could collect?
- What types of materials will you need to make this project happen? If materials cost money, do you have a grant, sponsor or plan to get them donated?
- Who might be good candidates for your research team? You must include one adult who works at EV, one college/university student, one 'expert' in the field, two students.
- List three organizations you could volunteer at that relate to your research topic.
- What products will come out of your research?
- When do you plan to present and defend your thesis?

Research Interests & Investigation (approximately 30 hours)

- Identify and analyze a sustainability issue tied to one of our themes
- Evaluate potential solutions to that sustainability issue
- Propose and justify actions that address the issue
- Develop vision and preliminary goals
- Identify a research question which, if answered, will enable the group to achieve their vision
- Conduct a first round of literature review of at least 5 sources supporting the need for your issue using MLA or APA
- Have an adult edit your review, make edits for a second round of literature review and adding at least 2 more sources supporting the need for your issue using MLA or APA
- Submit a one paragraph summary of your research proposal for our website.
- Submit your preliminary write up to your advisor

Action Planning & Research Methodology (approximately 30 hours)

- Develop and write about your mixed-methods methodological framework
- Identify and find or design tools for collecting quantitative data
- Identify and find or design tools for collecting qualitative data (surveys, interviews, focus groups, photo voice or observation)
- Create an action plan and timeline for your project
- Create a materials list for your project
- Create a budget
- Submit your budget for approval to your advisor
- Developing a research team
- Recruit adults, community members and students to join the research team
- Build relationships with your team

Action & Data Collection (approximately 50 hours)

- Learn and use skills for using research tools,
- Document the data (go to the field)
- Organize your data
- Find gaps in your data
- Collect additional data

Analysis & Reflection (approximately 100 hours)

- Identify emergent themes in qualitative data
- Find supporting quotes to support your themes
- Run statistical analysis of quantitative data
- Create charts and/or graphs to represent this data
- Come up with findings
- Get feedback from your research team on your findings
- Make recommendations for future research areas
- Brainstorm various tactics to take further action to address this issue
- Write a first draft of a research report documenting your findings
- Get feedback and make edits suggested by your advisor on your first draft
- Submit your findings to your research team for revisions
- Make edits and finish the second and third drafts of your report
- Write an abstract of your report

Presentation, Demonstration & Celebration (Approximately 80 hours)

- Prepare for your thesis defense
- Defend your thesis to your research team and advisors
- Share your findings with the community (city council meeting, play, PowerPoint, movie, website, etc.)
- Present at either or all: EV Presentation Night, Earth Day Celebration, or Green Schools Youth Summit
- Volunteer at a local community organization or business that addresses your research problem
- Submit a final reflection of the process
- Celebrate!

CURRICULUM VITAE

Joella Zocher

Academic Degrees

PhD	University of Wisconsin—Milwaukee	2015	Urban Education with Curriculum and Instruction Specialization and Science Minor
MS	University of Wisconsin—Stevens Point	2003	Natural Resources with Environmental Education Specialization
BS	University of Wisconsin—Stevens Point	1998	Majors: Biology Psychology Minors: Women's Studies Secondary Education

Relevant Professional Experience

2012-Present Advisor
Escuela Verde, Milwaukee, WI

Responsible for teaching and administrative duties as part of teacher collective at a public charter school in the city of Milwaukee. Designed and implement student-centered, project-based constructivist curriculum that integrates sustainability and restorative justice themes. Helped design and implement the Youth Participatory Eco-Justice Action Research (YPEAR) senior capstone projects. Connect students with community members, organizations and universities to push their learning beyond the walls of our school. Lead the team in strategic planning and visioning, sustainability curriculum development, budget development, grant writing, fundraising and reporting.

2012 Instructor
UW-Milwaukee

Responsible for designing and teaching undergraduate and graduate courses. Curriculum and Instruction 701 Curriculum Planning & Ideologies (CURINS 701), Pedagogy Labs (CURINS 565)

2011-2012 Teacher, Environmental Science, Biology, General Science
Centro Hispano High School, Milwaukee, WI

Responsible for development and instruction of an integrated curriculum for at-risk high school students at a Milwaukee Public Schools Partnership School. Teach courses with a variety of hands-on projects with an emphasis on integrating math and English skills. Liaison for community based education partnerships including Keep Greater Milwaukee Beautiful, Sweet Water Organics and the Urban Ecology Center. Helped three students participate in and win the 2011 Milwaukee Public School Science Fair and led fifteen students on a three night winter science trip to northern Wisconsin.

2008-2011 Washington Park Program Director,
Urban Ecology Center, Milwaukee, WI

Responsible for development and evaluation of the start-up years of the Washington Park Branch, including planning and implementation of innovative educational programs, community outreach events, and the hiring and mentoring of staff. As a member of the Leadership Team, contributed to strategic planning and visioning, budget development, grant writing, fundraising, marketing and reporting. Actively worked with community groups to address Environmental Justice issues in the neighborhood. Worked with the EPA to bring Lisa Jackson to Washington Park for a EJ focus group for neighborhood. Presented at local, state and national conferences on topics including: Environmental Justice, Urban Environmental Education, Sustainability, Open Space Technology and Service Learning.

1998-2008 Teacher and Assistant Director, Environmental Science, Biology, Physical Education, Cross Curricular
El Puente High School, Milwaukee, WI

Responsible for development and instruction of an integrated curriculum for at-risk high school students at a Milwaukee Public Schools Partnership School. Team-taught courses include Environmental Leadership Corps, Chemistry of Life, Biology of the Brain, Art of Life, Statistics of Psychology and Physical Education. Academic advisement and mentor for seniors. Liaison for community based education partnerships including Hope House, Growing Powers, Urban Ecology Center, Milwaukee Urban Gardens and Keep Greater Milwaukee Beautiful. Developed and coordinated dozens of weeklong camping trips across Wisconsin. Created and delivered workshops on alternative assessments. Mentored new and first year teachers. Received exemplary evaluations for all four years as an MPS employee.

2008 Conference Chair, Urban EE - There's more to a city than its skyline.
Wisconsin Association for Environmental Education's Fall Conference: Milwaukee, WI

Grants

Sweet Water Mini-Grant, 2015 ($5,000), Verizon Innovative Learning Grant, 2015 ($20,000), State Farm Youth Advisory Board, 2012-2013 ($100,000), Wisconsin Environmental Education Board, Urban Sustainable Forestry Project, 2011, ($29,805), Urban Forestry in Washington Park, 2008, ($19,427); El Puente Environmental Leadership Corps (ELC): Students as Environmental Entrepreneurs, 2004, ($5,000), Environmental Leadership Corps (ELC): A Year Long Multi-Disciplinary Environmental Club 2003 (13,140); Milwaukee Public Schools Foundation Excel Grant, Biodiversity & Green Space ($750) 2001-2002, DPI Wellness and Prevention grant, Youth Advocates 2006-2007, ($1,000)

Community Service And Consulting Experience

2014-Present	Arts@Large Eco-Literacy Initiative	Advisory Council Member
2014-Present	Latino Earth Partnership for Schools Conference Planning Team	Member
2014-2015	Built on Water Teacher Planning Team	High School Teacher Curriculum Planner
2010-2012	Milwaukee Public Schools Service Learning Advisory Team	Member
2010-2012	LEAF Advisory Committee	Member
2008-2011	Milwaukee Science Education Coalition	Member
2008-Present	North American Association For Environmental Education	Member of the Environmental Justice Commission and Diversity Committee
2008-2011	Washington Park Partners	Committee Member
2008-2010	USHER's Camp New Look	Committee Member
2007-2011	Stand Together Milwaukee	Board Member
2005-2013	Brewcity Bruisers Milwaukee Roller Derby	Board of Directors, Steering Committee Chairs, Captain, Junior Derby Coach
2008-2009	Medical College of Wisconsin's Violence Prevention Initiative	Committee Member
2006-2008	Wisconsin Association of Environmental Education	Board of Directors, current member of the EE Advocacy Advisory
2003-2005	Hope House	Science Teacher, after-school programs
2002-2006	Schroeder YMCA	Teen Adventure Committee Member
2000-2002	Milwaukee Urban Gardens	Board of Directors, Vice President

Licenses & Certifications

Licensed	Wisconsin Department of Public Instruction – Z260000590801 40 Professional Educator 605—9-12 Biology/Life Science 952—10-21 Alternative Education
Certified	American Red Cross, Lifeguard, CPR, First Aid

Professional Affiliations

American Educational Research Association
Midwest Renewable Energy Association
National Science Teachers Association
North American Association for Environmental Education
Wisconsin Associate of Environmental Education
Wisconsin Society of Science Teachers

Presentations

Zocher, J. (3.28.2014) “Escuela Verde: Making Education for Sustainability Relevant to Urban Youth.“ *presented at the National Green Schools Conference*, Sacramento Convention Center, Sacramento, California.

Zocher, J. (8.9.2013) “Escuela Verde: Making EE relevant to Urban Youth“ *presented at the annual Fall Conference of the Wisconsin Association for Environmental Education,* UW-LaCrosse, LaCrosse, Wisconsin.

Zientek, A. and Zocher, J. (3.16.2013) “Authentic Science in the Classroom” *presented at the annual conference of the Wisconsin Society of Science Teachers,* Patriot Center, Wausau, Wisconsin.

Zocher, J. (1.27.2012) “Homegrown Panel: Environmental Education in Action” *presented at the annual Winter Workshop of the Wisconsin Association for Environmental Education,*Treehaven, UW-Stevens Point, Tomahawk, Wisconsin

Zocher, J. (11.5.2011) “How does Youth Participatory Action Research Incorporated into an Environmental Justice Unit affect Scientific Literacy in At-risk Students?” *presented at the annual Fall Conference of the Wisconsin Association for Environmental Education,* Lions Camp, Rosholt, Wisconsin

Zocher, J. (10.14.2011) “Environmental Justice as a Motivator for Engagement with Inner-city Teens” *presented at the annual meeting of the North American Association For Environmental Education,* Raleigh Convention Center, Raleigh Durham, North Carolina.

Zocher, J. (10.12.2010) “The Urban Ecology Center: Environmental Education Reaches our Inner-city Communities” *presented at the annual meeting of the North American Association For Environmental Education,* Buffalo Convention Center, Buffalo-Niagara, New York.

Zocher, J., Kelly, C., Solin, J. (10.1.2010). “The Important Role of Transformative Learning in Sustainability Education” *presented at the annual meeting of the North American Association For Environmental Education,* Buffalo Convention Center, Buffalo-Niagara, New York.

Zocher, J., (10.13.2008). "Energizing Urban Learning: Urban Ecology Center Case Study" *Paper presented at the annual meeting of the North American Association For Environmental Education,* Century II Convention Center, Wichita, Kansas.

Zocher, J. (10.13.2008). "Environmental Education and Students with Cognitive Disabilities" *Paper presented at the annual meeting of the North American Association For Environmental Education,* Century II Convention Center, Wichita, Kansas.

References

Available upon request.