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The Art of Empathy: A Mixed Methods Case Study of a Critical Place-Based Art Education Program

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Abstract

Bowers (2001) described how our ecological crisis is marked by metaphors of difference and separation. By adopting an ecological paradigm, students have the opportunity to move past harmful distinctions that have characterized relations with the earth. Instead, students can move to a deep recognition of the interconnectedness of living things. Empathy, particularly with the environment, is deeply tied to such a paradigm. To help students develop this paradigm, a critical place-based art curriculum designed and implemented in a middle school classroom. The curriculum was informed by the ecological imagination, a call for education that embraces the arts as a way to conceive of new ecological perspectives and dialogues. Drawing exercises, interviews, surveys, journals reviews, observations, and focus groups were used to investigate student experiences. Data revealed that students' ecological paradigms increased as a result of their participation. Throughout the program, students exhibited empathy with the environment as they cared for nature, developed awareness, and accepted responsibility.

Introduction

Bowers (2001) described how our ecological crisis is marked by metaphors of difference and separation. One prominent underlying metaphor is humankind as superior to and separate from the natural world. Such metaphors can lead to detachment from, neutrality toward, and domination of the land. New ecological knowledge and attitudes cannot be added onto these anthropocentric schemas. An ecological paradigm presents an alternative. Through the metaphor of a complex web of interacting systems, humans are positioned as interdependent with the natural world. By adopting an ecological paradigm, students have the opportunity to move past the harmful distinctions and definitions that have characterized our relations with the earth. They can embody a deep recognition of the interconnectedness of all living things. To fully embrace such a paradigm, students must not merely identify these connections: they must experience and feel them. Empathy, particularly with the environment, is deeply tied to such a paradigm.

Empathy with the environment represents a sense of connectedness with the natural world. This connection often comes in the form of enjoyment of nature, empathy for creatures, sense of oneness, and sense of responsibility (Cheng & Monroe, 2012). Art education may be uniquely poised to help students cultivate this empathy with the environment as well as to help students develop ecological paradigms. First, art education has long held associations with empathy because of the relationship between aesthetic experience and empathy. During an aesthetic experience, empathy enables a dialogic, relational encounter between viewer and art object (White, 2009). Second, works of art can provide multiple ecological viewpoints. Third, art education has a tendency toward experiential engagement with the world that has the potential to change attitudes and behaviors. In recognizing this capacity of art education as well as in responding to calls within the discipline for social relevance, scholars have proposed various ecologically-responsive art pedagogies (Anderson & Guyas, 2012; Blandy & Fenn, 2012; Blandy & Hoffman, 1993; Gradle, 2007; Graff, 1990; Graham, 2007; Inwood, 2008; Lankford, 1997; Neperud, 1995). Despite this abundance of theory, research is needed to determine how students in ecologically-responsive art education programs experience ecological paradigms and empathy with the environment.

To address this need, I operated as a teacher-researcher to study middle school students in a critical place-based art education program. The curriculum was place-based as it centered art education directly within place—in the local context and content. Fused with a critical education component, the curriculum encouraged students to engage critically and creatively with local social, ecological, economic, and political issues as they studied art. Throughout the program, I examined how middle school students demonstrated ecological paradigms and empathy with the environment. This study asked:

1. How do middle school students demonstrate empathy with the environment throughout a critical place-based art education program?
2. How does participation in a critical place-based art education program affect students' ecological paradigms (pro-environmental orientations)?
3. Which aspects of a critical place-based art education program, if any, contribute to students' sense of empathy with the environment?

Through these questions, I sought to understand students' experiences and the impact of the program. This article presents an analysis of the students' ecological paradigms and then examines how students demonstrated empathy with the environment.

The Ecological Imagination

Greene (1995) thoroughly outlined the power of the imagination within the social world. She described how the imagination has the power to break through familiar definitions and distinctions that divide, to facilitate empathy, to expand our consciousness, to envision alternative realities, and to begin the process of working toward a better world. Such an imagination is needed within an ecological context, where arbitrary boundaries between humans and living things need to be bridged and new ecological realities need to be constructed. The ecological imagination calls for a new mode of education: education that embraces the arts as a way to conceive of new ecological perspectives, other ways of being in relation to the earth, better ecological alternatives, and new dialogues about our role in the world. A critical place-based art education answers this call. Through a critical place-based curricular approach, art education becomes a means of awakening the ecological imagination—opening the world to new relationships, new possibilities, new critiques, and, most importantly, new acts.

Empirical Literature

While the literature on ecologically-responsive pedagogies within the field of art education is limited, the place-based education literature is more robust. Studies demonstrate that place-based programs can positively impact students' environmental knowledge, awareness, and appreciation; sense of place; place attachment; academic achievement; achievement motivation; and critical thinking (Athman & Monroe, 2004; Azano, 2011; Buxton, 2010; Conaway, 2006; Ernst & Monroe, 2006; Howley, Howley, Camper, & Perko, 2011; Kuwahara, 2013; Lieberman, Hoody, & State Education and Environmental Roundtable, 1998; Powers, 2004; Santelman, Gosnell, & Meyers, 2011; Takano, Higgins, & McLaughlin, 2009). These programs have been effective in a variety of geographic locations and with a range of populations, regardless of race, achievement, or age. Among these programs, the Maple Ridge School Project in British Columbia is notable as it represents a combination of

place-based, ecological, and imaginative education (Blenkinsop, 2013; Derby et al., 2013). The program aims to provide students with opportunities to deepen relationships with the more-than-human world and to act as cultural agents of ecological change.

Although many theorists have proposed for art education to respond to ecological concerns, most accounts of programs are anecdotal (Anderson, 2000; Birt, Krug, & Sheridan, 1997; Holmes, 2002; Keifer-Boyd, 2001). The one empirical study to examine an ecologically-responsive art education program with K-12 students was Creel's (2005) participatory action research study. As an art teacher, Creel worked with upper elementary students with "at-risk tendencies" in an environmental art education program. She found that participation in the program helped students develop empathetic understandings and behaviors, pro-social skills, self-esteem, and confidence. However, research is needed to explore the effectiveness of such programs with other populations. Studies with middle school students in particular are needed since this age may represent a critical period for bonding to occur between students and the earth (Sobel, 1997).

Sobel (1997) asserted that one important goal of environmental education should be to help students develop empathy with the natural world. This goal is important given the connection between empathy and more responsible environmental attitudes (Schultz, 2000) and pro-environmental orientations (Karlegger & Cervinka, 2009). Additionally, several studies (Berenguer, 2007, 2010) suggest that empathy with the environment can be encouraged and can have a strong ecological impact on participants. Therefore, empathy is worth aiming to cultivate in students.

Methodology

I approached this study through a pragmatic paradigm, an alternative paradigm that positions the research questions as central to determining data collection and analysis methods (Morgan, 2007). Through this paradigm, I embraced both quantitative and qualitative methods. Mixed methods were used for expansion purposes (Greene, 2007) to expand the primary phenomenon, students' experiences of empathy with the environment, to include a secondary phenomenon, students' ecological paradigms.

I chose a case study design (Stake, 1995) to understand student experiences of empathy within the real-world context of a classroom. I strove to understand a single bounded system—a 7th grade introductory art class at a public middle school in the southeastern United States. Using one of my own classes as a teacher researcher provided me with a high level of accessibility. The class represented a typical case in its size of 20 students and in its inclusion of students from a range of socioeconomic levels and differing racial backgrounds within a traditional public middle school.

Data Collection Methods

This study, conducted January through May, was qualitative dominant. I conducted drawing exercises, interviews, focus groups, observations, and visual/verbal journal reviews to address the following topics related to Research Questions 1 and 3: 1) students' demonstrations of empathy with the environment during the semester, and 3) the aspects of the program that contributed to student empathy with the environment. A survey measured the quantitative variables related to Research Question 2—students' ecological paradigms (pro-environmental orientations).

Pre and post drawing exercises asked students to draw a time they felt connected to the natural world and to describe the experience in writing. The verbal data allowed for a pre/post comparison of students' experiences of empathy to understand how they might have changed since the beginning of the program. Post interviews with eight students supplemented this data by providing clarification and allowing for further rich descriptions of their experiences.

To determine students' ecological paradigms (pro-environmental orientations), I administered the New Ecological Paradigm (NEP) Scale for Children (Manoli, Johnson, & Dunlap, 2007) with students both pre and post. It provided an overall score, from 10 to 50, indicating their position on a continuum between an anthropocentric and eco-centric orientation as well as mean scores, from 1 to 5, on three dimensions: the eco-crisis, the rights of nature, and human exemptionalism—the view that humans are exempt from following the laws of nature. Throughout the semester, I recorded observations and reviewed student visual/verbal journals. I also conducted two post focus groups with a total of eight students who exhibited high levels of empathy in order to understand which aspects of the program were most effective in facilitating empathy with the environment (see Table 1).

Table 1.

Implementation of Data Collection Measures

Type	January	February-April	May
Pre and Post	Drawing exercise		Drawing exercise
	Survey		Survey
Periodic	Student visual/verbal journals		
	Observations		
Post			Focus groups
			Individual Interviews

=qualitative data collection measure

=quantitative data collection measure

Data Analysis

Regarding the mixing of methods, this study represents a component design with a parallel track data analysis. Li, Marquart, and Zercher (2000) described a parallel track analysis as both qualitative and quantitative components proceeding separately through data reduction and transformation until the data comparison and integration stage. By keeping each set of data separate during data reduction and transformation, I was able to uphold the procedures of both qualitative and quantitative methodological traditions (Greene, 2007).

To analyze the qualitative data, I used the constant comparative method from the grounded theory tradition (Glaser & Strauss, 1967). First, I used incident-by-incident coding to code each incident in the observations and line-by-line coding to name each line of data in the other verbal sources. All visual data supplemented the verbal data. Next, I used focused coding to reduce the codes to a small set of emerging themes. Then, I used axial coding to compare themes across each set of qualitative data as I wrote memos detailing the analytic process and exploring relationships among categories.

The survey data was tabulated and translated using descriptive statistics to include the frequency distribution, central tendency, and dispersion for each item as well as the distribution of difference for each dimension. Next, paired t-tests were conducted to ascertain whether the change between pre and posttest scores was statistically significant. After analyzing both the quantitative and qualitative findings separately, I then compared and integrated both types of findings to build the case study.

Curriculum

Orr (1994) claimed that students must first develop a relationship with the land before they are asked to protect it. Therefore, the curriculum was designed to allow for a relationship to develop and progress as naturally as possible. It began by helping students form a relationship with the natural world and with place. Then it asked students to imaginatively and critically consider alternatives of place. Last, it provided students with the opportunity to work toward protecting the earth. This last step of engaging students to take ecological action, in many ways, represented the apex of this curriculum.

The 18-week course was composed of three units—harmony, place, and transformation. In the harmony unit, students began by studying the illustrations of naturalist William Bartram, who traveled through our region in the late eighteenth century. Students took nature walks and drew their own illustrations of natural objects they collected. Later in the unit, they studied the art of Dave the Potter, an African-American potter and poet, who worked in our region during the nineteenth century. Students cultivated a plant and designed a ceramic planter for their specific plant. Through the activities of growing plants and designing planters, students had the opportunity to consider design connections between form and function as the planters were inspired by the form of their plant and responded to the needs of their plant.

Figure 1. Forbes, Isabel. (2011). *Rainy Night Krispy Kreme* [oil on canvas].

In the place unit, students examined local artist Isabel Forbes' paintings of older locales in the city. Through these paintings, Forbes explored the places that formed part of her childhood and their long-standing history. Forbes visited the class and shared her approach to painting, and then students reflected on special places in their lives and painted one of these places. Next, students studied Alexis Rockman's detailed depictions of place. In his series American Icons, large-scale paintings of notable American landmarks confront us with apocalyptic visions of our future where human civilization is in ruin and nature reasserts control. In response to Rockman's paintings, students reflected on important places in the community. Rather than fixating on the dangers of our current ecological course, most students envisioned a better ecological future for one of these places through a linear perspective drawing. Guest speakers from community organizations spoke with the class about different local green initiatives in order to help students identify possible features of a better future for their community.

In the transformation unit, students investigated the works of a wide range of eco-artists such as Nils-Udo, Lynne Hull, Chris Jordan, and Steven Siegel. During the unit, students visited a landfill, reflected on how waste materials can be repurposed, and then constructed eco-artworks from consumer waste. Many of the works students created throughout the semester were displayed throughout the school and community alongside their writings. Afterward, the works were dismantled and recycled.

As a teacher researcher, I refrained from making overarching statements about the environment and instead elected to provide students with information, opportunities for alternative experiences, and the chance to learn from others' experiences. This approach assured that students were not reiterating my own statements. In addition, I designed assignments with enough open parameters so that students were not required to focus explicitly on ecological themes.

Ecological Paradigms

In order to better demonstrate the impact of the program, I have presented an analysis of the students' ecological paradigms (pro-environmental orientations). The NEP Scale for Children (Manoli et al., 2007) was administered to students both pre and post to determine how the program affected their ecological paradigms and to gain a better understanding of their empathy with the environment.

Quantitative analyses. Descriptive and inferential statistics were used to estimate the effects of the treatment, participation in the critical place-based art curriculum, on students' pro-environmental orientations (n=18). The outcome variables were students' pre and posttest scores on the NEP Scale for Children (Manoli et al., 2007). First, the frequency distribution for each item from the 10-item survey, both pre and post, was calculated. Student post responses for environmental statements were strongly in agreement at 61.11% for item 1, "Plants and animals have as much right as people to live;" item 4, "People must still obey the laws of nature;" and item 10, "If things don't change, we will have a big disaster in the environment soon." An analysis of individual students' pre and post survey scores demonstrates that 14 students' scores moved toward an eco-centric orientation, 1 stayed the same, and 3 moved toward an anthropocentric orientation.

A comparison of mean test scores for the survey and for each dimension demonstrates that students showed an increase in each. With a mean pretest score of 3.33, students began the semester with a pro-ecological perspective. Their pretest scores for the rights of nature, 3.94, and eco-crisis dimension, 3.49, tended toward an eco-centric orientation; whereas, their human exemptionalism score, 2.56, reflected an anthropocentric orientation. Scores increased most for the eco-crisis dimension from 3.49 to 4.03. In addition, the mean overall survey score increased from 3.33 to 3.71 (see Table 3). Therefore, students concluded the semester with stronger pro-ecological worldviews. However, in the human exemptionalism dimension, students concluded still leaning more toward an anthropocentric orientation with a mean score of 2.74.

Table 2.

Comparison of Mean Pre and Posttest Scores on NEP Scale for Children (n = 18)

	Pretest		*Posttest*				
Factor	*M*	*SD*	*M*	*SD*	*t*	*df*	*p*
Rights of Nature	3.94	.83	4.35	.54	2.54	17	.0213*
Eco-Crisis	3.49	.84	4.03	.68	3.07	17	.0069*
Human Exemptionalism	2.56	.73	2.74	.82	0.72	17	.4840
Total Score for Scale	3.33	.53	3.71	.47	2.46	17	.0248*

*Statistically significant difference (<.05) between pre- and posttest scores

Treatment effects. Since the distribution of scores was approximately normal, paired t tests were used to determine the significance of the increase. The rights of nature dimension had a p-value of .0213, a statistically significant gain assuming the p-value is significant if $p < .05$. The eco-crisis dimension had a p-value of .0069, a more statistically significant gain. However, the human exemptionalism dimension had a p-value of .4840, a gain that contrasts with the other two dimensions in that it is statistically insignificant. Despite the disparate gains in the three dimensions, overall the increase in survey scores was statistically significant with a p-value of .0248 (see Table 2).

Discussion. In situations where a small sample size is used, a larger treatment effect than with large samples is necessary to obtain statistical significance (Wilkerson & Olsen, 1997). Thus, the small sample size (n = 18) of this study does not diminish the statistical significance of the increase in students' survey scores. Rather, it highlights the large treatment effect that was necessary to obtain statistical significance with such a small sample.

In addition, the qualitative data support this conclusion that students made gains in their ecological paradigms, particularly in their views on the eco-crisis. On the survey, students' scores increased most on the eco-crisis dimension, with a mean item score increase of .54. Student responses during the focus groups support this data. Students often used the phrase "opened my eyes" or a variation of the phrase to depict how their attitudes changed during the course. Moreover, they discussed how they became awakened to the degraded state of the earth and the need for change.

In contrast to the eco-crisis dimension, students showed little improvement in the human exemptionalism dimension. This dimension was measured by three anti-environmental statements that were reverse scored: "People are clever enough to keep from ruining the earth," "People will someday know enough about how nature works to be able to control it," and "Nature is strong enough to handle the bad effects of our modern lifestyle." When Manoli et al. (2007) administered this same survey to 672 students enrolled in an environmental education program, they also found lower scores in this dimension. The widespread nature of the anthropocentric responses in this one dimension in both studies suggests the prevalence of this ideology. This mode of thinking positions humans as separate from the natural world and exempt from natural limits (Williams, 2007). By operating in this paradigm, people have felt free to transform and exploit the natural environment for their own benefit. Because these metaphors have been prevalent since the Enlightenment, it is not surprising that students' responses continue to indicate the presence of this entrenched ideology. Further research is needed to examine this dimension.

Empathy with the Environment

I looked for evidence of empathy with the environment in student behaviors and reflections as I collected data from observations, student visual/verbal journals, and focus groups. Students' empathy with the environment was particularly evident in their care for nature, awareness of the environment, and acceptance of responsibility for it. Overall, students progressed in their empathy with the environment throughout the course as they moved toward greater ecological awareness and demonstrated a willingness to work for ecological change.

Caring for the Natural World

Many students demonstrated a form of care for the natural world as they cultivated radishes to transplant into the ceramic planters they constructed. However, for many students, their care was conditional and tied to the health of the plants. Thus, as the plants grew, students demonstrated care, but as the plants languished before reaching maturity, students disengaged. While this dimension of empathy did not develop linearly, the students' high level of care when they were engaged in cultivating plants is noteworthy.

Students' desire to care for their growing plants was most evident in their behaviors in the classroom as they frequently checked on them, watered them, and asked questions regarding their appropriate care. For instance, Malik asked to check on his plant almost every morning when he came into class. Students also indicated their interest in their visual/verbal journals. Nora wrote, "I like to take care and water my plant." Similarly, Kristen wrote, "I've enjoyed taking care of my radish, and it's grown a lot." This interest was sustained throughout the majority of the cultivation process.

However, students' lack of interest began to set in after several weeks, once plants began to languish and students lost faith that their plants would mature. During this time, students indicated their dissatisfaction with their plants' growth and their perceived lack of efficacy in cultivating them. Many students blamed their own actions for their plant's demise. Daniel said, "Maybe we tried too hard," and Malik said, "I overwatered it." He claimed the project was his least favorite because he was so frustrated that his plant died.

While many students expressed disappointment and frustration with the death of their plants, a few students saw it as a learning experience. Meredith indicated in a focus group that she had learned from her mistakes and would like to try again next year. Similarly, Emma expressed that she was not disheartened but rather challenged to improve in her ability to care for plants. She said, "It makes me want to grow more plants and try to learn how to take care of them and learn what they need, where they have to grow."

Developing Awareness for the Environment

In discussing their experiences throughout the semester, students indicated they were developing ecological awareness, which extended to their outlook on nature, their understanding of their relationship with the environment, their stance on the severity of the ecological crisis, and their perception of the need for change. Focus group responses most revealed these changes in awareness. Students often used the term "realized" and variations of the phrase "eye-opening" to describe how different experiences in the course helped them to see the world in a new way.

A few students indicated that they became more aware of the properties of nature as they participated in the course activities, such as the nature walks and the natural object illustrations. Lindsay said, "Once I actually got into that unit where we actually got outside and picked up stuff, it really helped me to open my eyes to see what nature can look like." She went on to explain how her close observation of a vine surprised her because she noticed new properties of the vine as she drew it. In a focus group, Adam described his newfound amazement with the flowers sprouting through his grandparents' old driveway.

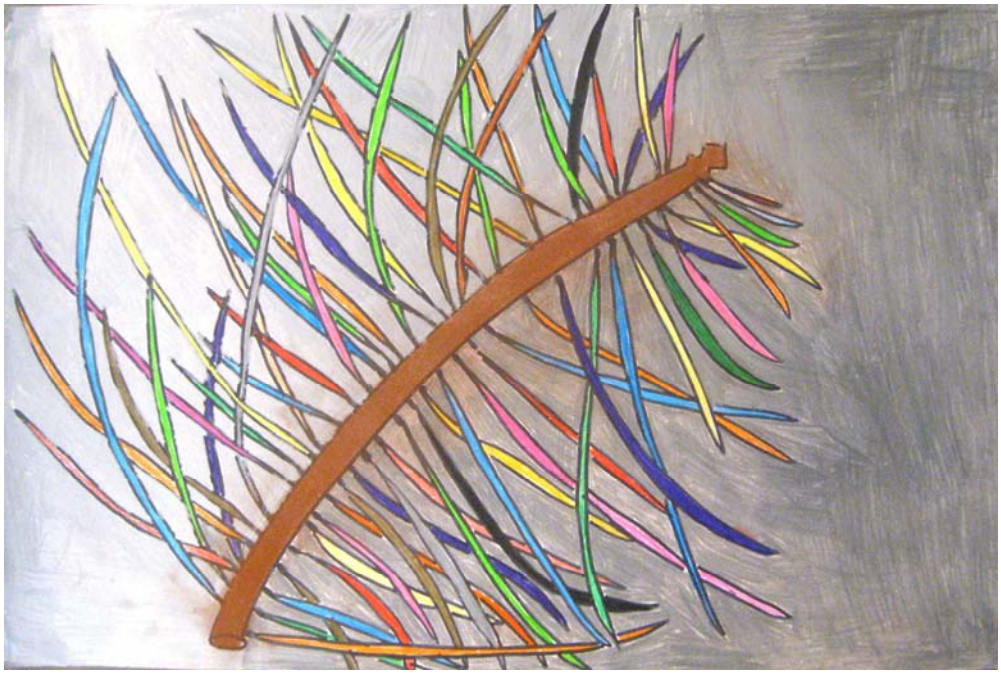

Figure 2. Emily's nature drawing. Mixed media.

Some students described how the class enlightened them to the positive things about the environment instead of fixating on the negative and on their obligations. Meredith said, "Now that we have studied [the environment], my eyes have opened, and I have seen all the positive things about it." She described how before the course, she did not pay attention to the environment, and when she did, she thought more about the negative things like pollution and our obligations to it. Similarly in the other focus group, Anna said, "I just thought that every place we went, every place we drew made me feel better about nature and that it really helped us to connect to the life we live, the things we do, and nature." Daniel described how painting a special place, a lake that he visits, helped him realize the importance of land preservation. He said, "It just really helped show me how important it is to keep our lakes and our lands clean and stuff and to preserve them so we can have them . . . ."

Figure 3. Emma's special place painting. Tempera.

While students were awakened them to the positive aspects of the environment, they also became aware of the environmental crisis. In the focus groups, several students indicated that they were not concerned about the environment before the course. For instance, Lindsay said, "So I didn't really care about the environment." Adam expressed similar sentiments and explained that he saw it as "pretty clean and stuff" before. The class alerted him to our ecological plight. He said, "It made me think that a lot of stuff is messed up like with pollution and stuff. It made me realize more about it." Similarly, Meredith said, "It just helped me to understand what situation our environment was. . . ." She explained how seeing "what all of our trash does and where it ends up" impacted her. In realizing the eco-crisis, students indicated they understood the urgency of the situation. Emma said, "[The eco-art project] really opened my eyes to how important [recycling] is and what you can do with it. And how important it is."

Figure 4. Landfill fieldtrip. Photograph.

The most significant area that students experienced an ecological awakening was in their relationship with waste. Students became more aware of waste, its impact on the earth, and the need for minimizing it. In addition, students began to see the potential value in waste materials. This change in awareness began with the landfill fieldtrip. Meredith concluded in her visual/verbal journal, "I think of waste differently b/c of what I saw." She explained in the focus group, "[The fieldtrip to the landfill] was also an eye-opener because there was so much [waste] just in that little area that I realized that we need to do something about that." By seeing the waste being buried in the ground and learning of its impact on the earth, students were awakened to its damaging presence and the need to find solutions. Adam described in his visual/verbal journal how he was affected by seeing the waste at the landfill: "To me I think it's bad to have a landfill, burying all that trash doesn't seem right. I think in a way it could damage the environment in the future." His comment shows an awareness of the predicament of the environment because of the disposal of waste and frames the situation in moral terms by using the terms "bad" and "right." Such comments suggest he is moving toward Leopold's (1949/1966) concept of a land ethic—the idea that there is a right and wrong way to treat the earth.

By gathering consumer waste and repurposing the items into an artwork, students developed an even greater awareness of waste and began to reframe their ideas about waste. Nora explained how repurposing materials into an artwork impacted her. She said, "You got to

think differently." She explained how the project changed her established ways of relating to waste:

> Well, usually I will just put a bottle in the recycling, and usually my dog will go in there and try to eat it, and I will have to stop it. But this time I actually got to turn it into something pretty. So we used a bunch of different things like buttons and stuff that people usually don't look at that way—like that could be a mouse' eye.

Others confirmed how they became more aware of waste and to afford it value. Meredith said:

> [The eco-art project] opened my eyes because you can use materials that are so worthless and make them into art and something that is beautiful. . . , the most random object that you can think of into something really beautiful.

Daniel agreed, "Yeah, because if you do that you can give it value." Later, Daniel described it as "another man's trash is another man's treasure." He went on to describe how he saw his neighbors' mass of plastic bottles in their trash/recycling bins and asked to use them in his artwork. They soon formed the limbs of his robot. In another focus group, Nora stated how she felt respect for trash "because it's not just trash—it's art." Lindsay explained how she enjoyed the project and how she found pleasure in transforming waste. She explained:

> I loved that because it shows that you can take simple things like cardboard and trash and turn them into to something beautiful and meaningful. . . . So taking something that is so decreased in value and turning it into something that can mean so much to someone. It really shows you how much things can change from one thing to another.

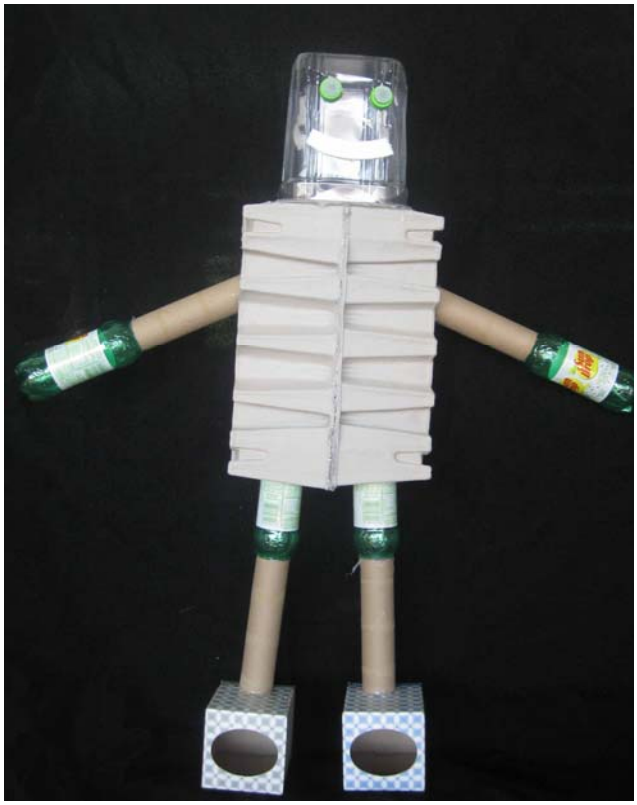

Figure 5. Adam, Austin, Daniel's group sculpture. Found objects.

Accepting Responsibility for the Environment

Students' descriptions of their changes in ecological awareness were often accompanied by professions of a need for change. For example, Meredith described the landfill field trip as an "eye-opener" and then said, "there was so much [trash] just in that little area that I realized that we need to do something about that." Students acknowledged the need for change, expressed their desire to change, and worked to affect change.

Responsible lifestyles. Throughout the program, students learned ways to adopt more responsible lifestyles and were awakened to the importance of changing their current ways of relating to the earth. Daniel described how the class was helpful in learning "what we can do in taking a step to make the earth greener." Students explained how they learned practical steps throughout the course. For example, Emma described how the guest speakers introduced her to new ways of helping the earth. She said, "Like what [the guest speaker] said today, pick up animal wastes and pesticides. But you can build a brush zone, like when it rains, it will catch all the wastes and let the good water go."

As students considered ways to adapt ecologically-responsible lifestyles, recycling was the lifestyle change that students most emphasized. Through visiting the landfill, students began to understand the problems and issues surrounding the disposal of waste. In her visual/verbal journal, Samantha described how the trip affected her attitude. She wrote, "I now know how important it is to recycle and take care to conserve the land used building landfills." Likewise, Meredith advocated for reducing waste. She said, ". . . we need to cut back on all of our waste so it doesn't overpopulate the landfill." Students' comments towards the end of the course indicated that they realized the severity of the situation and the need for drastic change. For instance, Daniel said, "If we don't start recycling and helping our planet then we might not be here for much longer."

Without prompting, a few students made a pledge to change. For instance, Nora wrote, "I will try to save energy, create peace, and live in harmony." Lindsay declared, "I will be greener and continue to recycle and clean up the community." In his visual/verbal journal, Adam wrote, "I will start to recycle more instead of throwing it away in the trash can." Through making changes and accepting responsibility for the earth, students demonstrated their sense of environmental agency.

Responsible art. Students also showed a strong commitment to creating ecologically-responsible art. One way that students demonstrated their commitment was in scavenging for waste materials to repurpose for eco-artworks. For instance, one group of girls had the idea to create a cow from milk jugs and cartons. To obtain these materials, they brought in empty jugs from home and a local café. They also used their lunch periods to collect milk cartons from their peers. Anna described it: "Collecting the milk cartons was an experience that I will never forget because it was so embarrassing and disgusting, and it smelled like dirty laundry. Also, we had to clean them out." To realize their artistic vision, they were willing to endure the unpleasant task of emptying others' used milk cartons and washing them. On other occasions, students' commitment to ecologically-responsible art extended beyond the class. For instance, Emma's mother shared how Emma had insisted that rather than throwing broken plates away at home, she should save them to make a mosaic.

Figure 6. Emily, Anna, and Morgan's group sculpture. Mixed media.

Toward the end of the course, students showed an awareness of the ecological significance of their artistic acts. For instance, Adam reflected on the sculpture he created from his neighbor's used plastic bottles. He wrote in his visual/verbal journal, "Without the reuse of bottles, we would be polluting more." Besides showing an awareness of how they were repurposing materials and eliminating additional waste in a landfill, students were also aware of how their works might impact others' ecological attitudes. Meredith wrote about how she expected people to respond to her eco-artwork, "I think people will realize that trash is not useless and you can turn it into anything." Overall, students understood the global significance of their actions. One student described the experience of creating art from waste, and then Anna responded, "You were saving the earth."

Discussion

The circumstances surrounding the plants both facilitated and inhibited a caring relationship. Daniel explained, "Well, the radishes. . . . It could be joy when they would grow, but it could be a pain in the butt when they didn't so . . . it's a love/hate relationship there." Noddings (1984) declared that conflict and guilt will always be risks of caring. In this case, these feelings were not productive in continuing the caring relationship and in encouraging students

to engage in similar caring relationships with plants, particularly since they reduced many students' self-efficacy for growing plants. This reduction is unfortunate given that perceived self-efficacy is linked to pro-environmental behaviors (Cheng & Monroe, 2012). This situation emphasizes the importance of facilitating successful caring relationships between students and plant life.

Students' developing relationship with the environment, in the form of an expanding awareness and acceptance of responsibility, is consistent with the body of research on the affective impacts of environmental education programs. In particular, it strongly aligns with the findings of Conaway's (2006) study, which found that middle school students in a place-based education program improved in their environmental awareness and sense of personal responsibility and care for the environment. Overall, these results support the existing empirical literature to suggest the ability of place-based education, and specifically critical place-based art education, to facilitate positive relationships with the environment.

Limitations

Since this study was designed as a case study, the results are not intended to be representative of the general population. The reader must examine the characteristics of the case and determine its transferability to their own context. Since girls tend to have more affective attitudes toward the environment and pro-environmental worldviews than boys (Boeve-de Pauw, Donche, & Van Petegem, 2011), the overrepresentation of girls, 15 out of 20, in this case is a significant factor to consider when determining the transferability of the results to other populations.

In addition, its design as teacher research is a significant component of the case. As a teacher researcher, I was highly invested in the process. This investment could have translated into higher quality instruction, more individualized attention, and attentive planning, which could have contributed to more positive results than might have occurred in a typical classroom. Another concern with any researcher who has a dual role in the research process, such as that of teacher and researcher, is the potential for role confusion (Asselin, 2003). Because of my role as teacher, I was aware that I had a strong desire to see students develop empathy for the environment. By acknowledging this desire as a researcher, I hoped to minimize its impact on the data collection and data analysis phases. I realized that I would be negotiating my role as teacher and researcher throughout the semester, and that these roles might occasionally conflict (Cochran-Smith & Lytle, 2009).

Conclusion

At the conclusion of the focus group, Emma stated:

> I think that it was good to learn about this, especially in art class rather than in—I mean, it's good to learn about it in Environmental Awareness [class], but it was really good to learn about it in art because it probably influenced some people who don't recycle or can't recycle. I think that it was good that we learned about it because hopefully it opened people's eyes and makes them want to help and, yeah, take care.

Emma valued how the curriculum was capable of helping students to develop awareness, to care, and to take action. She realized the need for this curriculum in art classrooms in order for it reach not just those students who are already concerned for the environment, such as those who might enroll in an environmental awareness class, but also to reach other populations. She might also have recognized how art education is particularly positioned to address these issues and to cultivate connections.

Overall, this study demonstrated that a critical place-based art education curriculum is capable of promoting students' ecological paradigms and empathy with the environment. However, given the parameters of this study, the extent to which these phenomena persist is unknown. Longitudinal studies are needed to examine how these phenomena may or may not persist after student participation has ended. Additionally, research should be conducted with other populations including students of other ages and races and from other geographical areas. Studies conducted with urban populations could provide an understanding of this educational approach's impact on students in urban areas as well as insight into the complexities of implementing this curricular approach in urban schools.

Such research is imperative to understanding and successfully cultivating empathy with the environment—a critical capacity that allows for the dissolution of arbitrary boundaries between humans and other living things, an expansion of consciousness for other life forms, the development of care, and the tendency to act for ecological change. Herron (2009) offered insight into how art education is uniquely suited for this endeavor:

> Whether we create art or are its audience, art carries us into deeper awareness and compassion. . . . Through art we feel our way toward an extended empathy that includes not only people but also the earth and other species. With the full extension of that larger identity, it becomes possible to imagine a sustainable world, one in which we see ourselves as interdependent in a nonhierarchical web of living systems, each essential for the survival of all. (p. 121)

Art educators should embrace this capacity of art to facilitate empathy with the environment

so that students are capable of pushing past dominant anthropocentric philosophies and paradigms to embrace an ecological paradigm—a necessary paradigm for sustained ecological change to occur. A critical place-based art curriculum offers fertile ground for this empathy to grow.

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