ENVIRONMENTAL EDUCATION + ART: CONCEPTS AND CONNECTIONS IN THE ART CLASSROOM

By

BARBARA J. RAY

A CAPSTONE PROJECT PRESENTED TO THE COLLEGE OF FINE ARTS OF THE UNIVERSITY OF FLORIDA IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF ARTS

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Chair: Elizabeth Delacruz
Committee Member: Jodi Kushins
Major: Art Education

Abstract

Environmental education presents a commanding contribution toward educating the public on important environmental issues, art has long been a conduit for environmental awareness and there is an urgent need today to open up all channels of communication in order to address the pressing environmental issues of our time. For these reasons, it makes sense to bring environmental and art education together in the art classroom. My study employed a new approach to art education that emphasized environmental literacy, investigated the ways environmental education (EE) informed art making and discovered the capacity of art to connect humans to the environment. My study was in a curriculum that included the five key EE
principles of awareness, knowledge, attitudes, skills and collective action. In addition, I illuminated the role of art and artists who meet environmental education goals through their work.

I applied action research methods for my study and used several tools to help me triangulate data and situate my work in the real world. A journal, a camera/video recorder, the Plan, Do, Study, Act (P.D.S.A.) tool, a survey, worksheets and interviews helped me to keep track of the activities in the classroom. Action research allowed me to take my study to its fullest potential by making daily connections in the real classroom, while evaluating teaching and learning as it occurred as I moved through the EE + Art unit of study. My findings concluded that EE + Art are a good fit, that EE works to improve personal responsibility and art intersects with the environment through conceptual works of art. Documentation for my study can be found on my website at http://www.artandenvironment.weebly.com which includes a week-by-week summary of activities, a gallery of student work, stories, photos, interview transcripts and journal pages.

My capstone paper chronicles the systematic processes and findings of my study. I outline the EE component first, as this was the primary focus of my study and the most crucial element because it informed and educated students on real and current environmental issues. Then I illuminate the role of conceptual art and artists who meet environmental educational goals through their work. These examples provided students with inspiration for their own work and encouraged conceptual thinking. I describe the art projects- trash people and conceptual sculptures using recycled/reclaimed materials, which culminated in a sculpture garden on the school courtyard, where students exhibited their art to parents and attendees at parent/teacher conference nights.
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After weeks of preparation, my plans materialized into something tangible and I realized that my classroom transformed from an ordinary art room into something quite extraordinary. In the corner, I had a cache of curious and unusual recycled items, garnered from barns and dumpsters, and an assortment of garage sale cast offs. Environmental education posters replaced the Elements and Principles of art posters. It was not that I wanted students to cast aside everything I had taught them about art the past five years, rather, I wanted them to see art in a new way and take their knowledge of art to a new level. Learning in this context necessitated that I moved beyond traditional teaching methods and enter into a realm of critical thinkers and free choice.

**Statement of the Problem**

Art education and environmental education do not coincide consistently in the art classroom. Art education relies on a random philosophy when it comes to including EE in an art curriculum for many different reasons. National and state standards allow some room for environmental education but do not specifically address EE + Art concepts as a unit of study. “The Standards address competence in the arts disciplines first of all, but that competence provides a firm foundation for connecting arts-related concepts and facts across the art forms, and from them to the sciences and humanities. For example, the intellectual methods of the arts are precisely those used to transform scientific disciplines and discoveries into everyday technology” (National Standards for Arts Education, 2000).

I propose that now is an important time to address major environmental issues in the art classroom. The National Science Board’s *Environmental Science and Engineering for the 21st Century* report supports my view when it states, “The environment is a critical element of the knowledge base we need to live in a safe and prosperous world” (National Science Foundation,
(ppara. 9). In addition, the article, “What is Environmental Literacy” (Environmental Literacy Council, 2008) states “while we cannot predict all the issues the next generation will confront, we can be certain that among them will be issues related to the environment. Health, quality of life, and our relationship with nature are all shaped by environmental actions” (para. 1).

Environmental education, in turn, does not actively seek the input of art education or artists in solving environmental issues. According to the 2002 report, *Developing Environmental Awareness through Art* (greenmuseum.org, 2002) decision-makers in the environmental realm do not involve artists in decision-making processes. Engineers, architects, and even landscape architects do not, as a matter of routinely engage in dialogue or collaborative efforts with artists. Even scientists, ecologists and environmental consultants do not view artists as partners in the process of environmental problem solving (para. 6).

I hope to develop a collaborative relationship between art education and environmental education, which may result in solutions that offer effectual resolutions to environmental issues. My study is especially relevant to the 21st century because, in many ways, time is indeed running out regarding how our expected quality of life will sustain itself in the future. Now is an opportune time for young people to be aware of and knowledgeable about environmental issues, develop attitudes and skills that contribute to the health of the planet, and develop a plan for collective action. It is time for art education to embrace environmental literacy in order to create citizens who are educated on environmental issues, encouraged to evaluate their relationship with the environment, and able to enlighten others through art.
Goals of the Study

For my study, I designed and implemented a fourth grade curriculum that included environmental literacy and environmental art projects. My intent was investigate how the five key EE principles (awareness, knowledge, attitudes, skills and collective action) informed students, challenged attitudes about the environment, fostered environmental action and introduced a new dimension to students’ art, culminating in an outdoor sculpture garden. Through a variety of outdoor extension activities, EE resources, and making art from recycled materials, students will learn and be able to:

- Understand and discuss important environmental issues
- Recognize personal responsibility for the environment
- Create art using recycled materials that makes an environmental statement
- Create a public installation of art in the school courtyard

Research Questions

The following questions became the guiding focus of my investigation into EE + Art.

1. How can the five key Environmental Education components (awareness, knowledge, attitudes, skills and collective action) apply to the art classroom?
   a. How will students transfer learning to life outside of the classroom?
   b. How will these components challenge and inform art making?

2. What negative human exploits and positive human achievements affect the environment?
   a. How will students make a connection between their actions and environmental issues and develop life skills that will help the planet?
   b. How will students make connections between art and the environment?
   c. What are other young people doing to be good stewards?
3. How does art intersect with the environment?
   a. How do environmental artists affect public perception of environmental issues?
   b. How can student art relate environmental concepts?

Rationale and Significance of the Study:

Environmental education provides the knowledge that lays the groundwork for analyzing environmental problems, resolving conflicts, and preventing new problems from arising (North American Association for Environmental Education, 2012). My study utilized environmental education principles to foster environmental literacy in the art classroom.

The Environmental Literacy Council (ELC) describes environmental literacy as “requiring a fundamental understanding of the systems of the natural world, the relationships and interactions between the living and the non-living environment, and the ability to deal sensibly with problems that involve scientific evidence, uncertainty, and economic, aesthetic, and ethical considerations” (ELC, 2002, p. 2).

Assumptions

My fundamental assumption was that EE would help students connect their art to environmental issues. Ultimately, I hoped that they would connect human actions to the health of the environment as well. I assumed that fourth graders were capable of attaining some level of personal responsibility and commitment to a healthy environment. I hoped to transfer my personal beliefs that humans can have a positive impact the environment and reverse the damage we have done by exhibiting responsible behavior. At the same time, I wanted them to think for themselves, to form their own opinions, to internalize the information they received and to take action. I anticipated that as I introduced new ideas and dimensions to art making that they would
embrace these new ideas and create their own conceptual works of art. Furthermore, I predicted that my population was comprised of a typical cross section of fourth graders and that my methodology was right for the study, measurable and as accurate as possible.

**Definition of Terms**

**Environmental Literacy.** The Environmental Literacy Council (ELC) describes environmental literacy as “requiring a fundamental understanding of the systems of the natural world, the relationships and interactions between the living and the non-living environment, and the ability to deal sensibly with problems that involve scientific evidence, uncertainty, and economic, aesthetic, and ethical considerations” (ELC, 2002, p. 2)

**Environmental Education.** According to the North American Association for Environmental Education (NAAEE)

Environmental education (EE) teaches children and adults how to learn about and investigate their environment, and to make intelligent, informed decisions about how they can take care of it. EE is taught in traditional classrooms, in communities, and in settings like nature centers, museums, parks, and zoos. Learning about the environment involves many subjects—earth science, biology, chemistry, social studies, even math and language arts—because understanding how the environment works, and keeping it healthy, involves knowledge and skills from many disciplines. EE works best when taught in an organized sequence. In schools, EE often reflects state and national learning standards.

"Done right," EE not only leads to environmentally literate people, but also helps increase student academic achievement. (What is Environmental Education, NAAEE website, para. 1).
Environmental Art. Greenmuseum.org describes environmental art as “art that helps improve our relationship with the natural world” (What is Environmental Art, greenmuseum.org website, 2010). Sam Bower, executive director at greenmuseum.org, adds, “At greenmuseum.org we use "environmental art" as an umbrella term to encompass "eco-art" / "ecological art", "ecoventions", "land art", "earth art", "earthworks", "art in nature" and even a few other less-common terms” (A profusion of terms, greenmuseum.org, para. 3).

Conceptual Art. The definition derived from Encarta® World English Dictionary North American Edition states that conceptual art is “art conveying concepts: art designed to present an idea rather than to be appreciated for its creative skill or beauty, often making use of unconventional media instead of painting or sculpture” (http://www.bing.com/Dictionary/search?q=define+conceptual+art&qpvt=what+is+conceptual+art&FORM=DTPDIA).

Artist Statement. According to Artstudy.org an artist statement lets you convey the reasoning behind your work-- why you chose a particular subject matter, why you work in a certain medium, etc. Further, a well-written statement shows the relationship of you to your artwork, and helps creates a connection with the viewer that will make your work (and your name) more memorable (http://www.artstudy.org/art-and-design-careers/artist-statement.php).

Limitations of the Study

Limitations include how to make EE + Art fit within state and district standards and essential curriculum requirements. This is less of a problem at the elementary level and curriculum guidelines vary by state and district. Other limitations include variables such as personal or family belief systems and the tendency for this age group to succumb to peer influence. Another limitation was time- the six-week unit afforded only six hours of actual class
time. Another limitation was student absenteeism—students who were absent one class period missed critical EE information. Still another was a general lack of production and fabrication skills, which required extra work on my part.

**Literature Review**

My thesis in this project is that the principles that drive environmental education can serve as a model for art educators who want to include environmental art in their curriculum. The goal of environmental education is to improve quality of life by providing people with strategies to solve and prevent environmental problems. The underlying principle of environmental education is that environmental distress decreases the quality of life. The aim of environmental education is to persuade people to take responsibility to maintain the earth’s resources in a sustainable way. The principle behind this aim is that knowledge lays the groundwork for analyzing environmental problems, resolving conflicts, and preventing new problems from arising (NAAEE, 2012). I maintain that art education can benefit by taking note of environmental education principles and including them in an art curriculum.

The objective of my literature review was to provide an overview of environmental education’s abiding principles in order to demonstrate how environmental literacy can benefit art education. My literature review includes interpretations on how art education can benefit environmental education as well, because it is my view that collaboration can contribute to distribution of the environmental literacy message. In addition, my review includes artists who meet environmental education’s principles and goals through their work. Examples of successful art and art activists demonstrate how environmental art that takes environmental principles to heart can educate and influence the public.
Principles of Environmental Education

In a lecture by Thomas Hudspeth, Professor of Environmental Studies and Natural Resources at the University of Vermont, he positions environmental education within the broad context of environmentalism (Hudspeth, 2002). According to Hudspeth, environmental education considers the total environment and is a continuous lifelong, interdisciplinary process that examines major environmental issues from local, national, regional and international points of view. Environmental education focuses on current and potential environmental situations while taking into account the historical perspective. It promotes the value and necessity of local, national and international cooperation and explicitly considers environmental aspects in plans for development and growth. Environmental education relates environmental sensitivity, knowledge, problem-solving skills and values, helps learners discover the symptoms and real causes of environmental problems, emphasizes the complexity of environmental problems, critical thinking and problem-solving skills and utilizes diverse learning environments. According to the Intergovernmental Conference on Environmental Education, “it would be the task of education to make people aware of their responsibilities in this connection, but in order to do so must first be reoriented and based on an ethos of the environment” (UNESCO, 1978, p. 6).

The Campaign for Environmental Literacy describes five essential components to obtaining environmental literacy (http://www.fundee.org/facts/envlit/components.htm).

Awareness. Awareness is holding a general impression, or consciousness, about something. An individual may be aware that climate change is an issue or that human life depends on a healthy environment without knowing much more. Environmental awareness can arise from many activities - education being just one.
Knowledge. Developing knowledge requires more than acquisition of new information or data. It requires an orderly comprehension, application, analysis, synthesis, and evaluation of that material as well as the intellectual framework within which new information can be placed. Developing knowledge often requires a pedagogy-a formal methodology for constructing knowledge with the student.

Attitudes. Developing attitudes of appreciation and concern for the environment is a subtle process that is difficult to deliberately program. Many educators believe that attitudes change primarily from a variety of life experiences, which can take place outside as well as inside the classroom.

Skills. Most consider skill development to be a practical exercise, often with an orientation towards a future career, even though the line between knowledge development and skill development can be imprecise. Skill development is an essential part of a formal (or non-formal) education program.

Action. The ultimate goal of environmental literacy programs is developing the capacity for action and participation, a complex process that requires adopting new behaviors. In addition, it often requires all of the steps above as well as such elements as personal mentors and life-changing experiences.

Placed in the context of art education these components are useful in forming an EE + Art curriculum that works. The following figure represents the levels of understanding that lead to action on environmental issues.
Environmental Education + Art

Figure 1.1 Chart detailing levels of understanding

- **Capacity for personal and collective action** and civic participation
  - ↑
- **Problem solving and critical thinking skills**
  - ↑
- **Attitudes** of appreciation and concern for the environment
  - ↑
- **Knowledge** and understanding of human and natural systems and processes
  - ↑
- **General awareness** of the relationship between the environment and human life

*Figure 1.1.* Chart obtained from the Campaign for Environmental Literacy website (CEL, 2007), clearly demonstrates the need for knowledge that begins with awareness and leads to action.

Environmental literacy leads to understanding of the interdependency between humans and the planet, another key principle of environmental education. Environmental educators view this interaction in three parts: dominion (humans over nature), stewardship (humans caring for nature) and union (humans as part of nature) (Boulding & Senesh, 1983). Art educator Don Krug (2003) describes dominion as the exertion of human control over the natural environment, stewardship as the balance between nature and constructed spaces, and union as a principle that values ecological, sustainable development. Dominion, stewardship and union are prominent principles for art educators to grasp because they convey the perspectives people embrace, which influences their action or inaction regarding environmental issues. Dominion, stewardship and union are critical elements to understanding human interaction with the environment. Similar to Krug, Heimlich (1992) asserts that environmental education is the process of moving individuals...
toward stewardship and ultimately a union view. Along these same lines, Schultz (2000) clarifies that environmental concerns relate directly to the degree with which individuals see themselves as part of the natural world.

Recognizing the importance of connecting humans to the environment, environmental educators promote a union view through education measures aimed at influencing people to examine their attitudes and behaviors. Some educators suggest specific tools to assist educators in this endeavor. For example, the nature relatedness scale, developed by Nisbet, Zelenski, and Murphy (2009) is a tool that measures an individual’s level of affective, cognitive and experiential connectedness with the natural world. The guiding principle here is human connection to the planet and the ability to embrace environmental concerns. The nature relatedness scale is useful measurement for art education because it encourages reflective and critical thinking about an individual’s perspective on their habits and behavior in relation to the environment. Self-examination of personal behaviors can create personal responsibility as individuals examine their views, patterns and manner of thinking. Shifts in thinking about personal responsibility can benefit art education by understanding the sense of responsibility or irresponsibility humans have toward the environment.

Environmental stewardship, a component of environmental education noted by Krug and others, is an important concept that directly relates to personal responsibility. The U. S. Environmental Protection Agency (2005) defines stewardship as “the responsibility for environmental quality shared by all whose actions affect the environment” (p. 8). Such actions require learning and steps in the learning cycle have been identified as awareness, concern, understanding and action (McHardy, Blanchard & deWet, 2009). Awareness leads to concern, results in understanding and can lead to action. These steps align with the principles of
environmental education and can provide a strong foundation for including environmental education in an art curriculum.

The principle of sustainability is another foundational, ethical standard and principle in environmental education from which art education can benefit. Wood (1997) described sustainability as “development that uses natural resources in an efficient way without destroying the basis of their productivity. Sustainable development allows natural resources to regenerate” (p. 4). This basic understanding is fundamental to environmental education. This primary concept is important because the study of ecology and responsibility for the planet is a natural fit for contemporary concepts in art education (Miraglia & Smilan, 2009). The ecological crisis is one we should all own, and the crisis of sustainability affects all humans. A sustainable future includes environmentally sound, socially equitable, culturally sensitive and economically just education rooted in an environment of knowledge, interaction and change. A sustainable future comprises formal learning that is relevant to life outside school while addressing the problems of our world (United Nations Educational Scientific and Cultural Organization, 2012).

My literature review captures some of the important dialogue taking place regarding the role of environmental education in relation to art education. Although art has played a role in bringing awareness to environmental issues in the past and present, it is my view that art education as a discipline has not widely broached the subject with clear understanding or systematic educational approaches Perhaps the guiding principles in art education should be re-examined in light of the environmental principles outlined within this section.
The Arts and Environmental Education

My literature review thus far has yielded some principles that can benefit art education, but raises questions about how environmental education fits into the art classroom. Branagan (2005) adamantly asserts that the arts benefit environmental education, not the other way around. Art carries a powerful visual ability to communicate complex ideas in simple ways. Text based communications can be ineffective because people do not respond to long discourses regarding environmental issues. Additionally, Branagan (2005) claims that the arts play a role in exposing corporations and government covert processes and promote open debate. The arts create a liminal atmosphere whereby resistance to behavior change is broken down. The arts assist with interactive communication, foster emancipatory learning and reach large, diverse audiences. Zakai (2002) proposes promoting the artist's role as a means toward environmental progress.

These are not entirely new concepts. The history of art and environmentalism goes back as early as 1872 with artist and naturalist Thomas Moran, who was instrumental in illustrating the beauty of the American west. John Muir’s writings in the late 1800’s also captured the imagination of the public with 300 articles and 10 major books that recounted his travels, expounded his naturalist philosophy and passed it on to others. Muir was keenly aware of the devastation of mountain meadows and forests by sheep and cattle (Perrottet, 2008). Recent history highlights many contemporary examples of art’s contribution to environmental awareness with artists such as Robert Smithson, Andy Goldsworthy, Richard Long and Agnes Denes. In my research, I explored the relationship between environmental artists and education. Did environmental education principles drive these artists to create their work, and did the works contribute to environmental progress? How can artists and educators rely on art education principles to communicate concern for the environment through art?
Activities currently emerging on the international art scene can serve as models for a new partnership between art education and environmental education. International art projects such as the 2012 Chen Long Wetlands Environmental Art Project generates warranted attention to negative and positive environmental occurrences because the project reflects on environmental issues surrounding food production and emphasizes organic aquaculture.

Contemporary art education can benefit by abiding by the environmental education principles of interdependency, sustainability and reflective perception of collective and individual behaviors. Many contemporary artists devote their life and art to the exploration and response to environmental problems and become educators through their art. Subhankar Banerjee demonstrates the relationship between environmental and art education and meets the above criteria through art and educational practices. His concern for environmental issues leads the way for art to engage in activism for environmental causes. Banerjee’s work promotes the preservation of ecology and culturally significant areas of the arctic and prompts debate about human to land disconnections. In Banerjee’s (2007) view, devastation of the planet should not be a normal part of progress.

At the heart of environmental education and environmental artworks is a respectful regard for nature and preservation of the land. Although some scholars debate the usefulness of environmental art in creating awareness of environmental issues, at this point I will leave that topic for further review. My personal view aligns with Brady’s (2007) in defense of art and artists. Earthworks, ephemeral and ecological art forms “enable diverse forms of aesthetic-moral interaction with natural environments and provide insight as to how humans value nature” (p. 297). Connection to nature can occur on a local and global scale, bringing attention to human responsibility in relationship to environmental issues through art.
Research Methodology

I used action research methods for my study, a type of applied research in which the researcher is actively involved in every aspect. Action research is a “research technique employed by teachers to improve upon the education environment in the classroom. The Center for Collaborative Action Research describes action research as “ a process of deep inquiry into one's practices in service of moving towards an envisioned future, aligned with values. Action research is the systematic, reflective study of one's actions, and the effects of these actions, in a workplace context” (Riel, M. Understanding action research. Center for Collaborative Action Research website). Usually informal, action research can take the form of teachers analyzing behavior and various classroom situations to better understand their classroom environment” (Education.com. 2012, Glossary of education).

According to “How to do Action Research in your Classroom” (Rust, F & Clark, C.) the cycle of action research includes five key steps:

1) Making the commitment (The call to inquiry)
2) Designing a study (Questions & answers)
3) Making sense of the experience (Data & analysis)
4) Beginning again (New & better questions)
5) Improving your practice (Lessons from experience)

Utilizing these steps has helped me gather data systematically and consistently evaluate results. First, I researched EE principles and developed essential questions. Then, I designed an EE + Art unit of study relevant to fourth grade students. Next, I used a journal, a camera/video recorder, the Plan, Do, Study, Act tool (P.D.S.A.) as mandated by my district, a survey, worksheets and interviews to analyze and reflect on the classroom experience during and after
each lesson. Reflection yielded new and better questions as I developed an understanding of students’ knowledge base and capabilities. Finally, I learned what worked and what did not work in the classroom in order to improve teaching practices.

Subjects

My study, comprised of two fourth grade classes at Manor Heights Elementary School in Casper, Wyoming, involved a total of 49 students, 29 male and 20 female. General demographics indicate 94% white with a median household income of $52,000.

Research Site

Casper, the second largest city in Wyoming with a population of 55,316, is primarily an agriculture and mining community. The city of Casper, surrounded by small rural towns and vast expanses of open prairie, offers five museums, city parks, an international airport, restaurants and shopping opportunities. Casper Mountain is just 10 miles from the city and offers summer and winter recreation activities.

Manor Heights School is relatively small with approximately 356 students. It is a great place to teach. All of my art endeavors have full support and throughout my EE + Art unit teachers and staff brought in items for the recycled art project. It is now common for me to come into the lounge and find items earmarked for the art room. The sculpture garden was advertised on the school website and I received many emails of praise for student work. Readers can follow the story at [http://www.natronaschools.org/story.php?id=70&story=2277](http://www.natronaschools.org/story.php?id=70&story=2277).

Research took place in my art classroom which is a portable building located a short distance from the school, adjacent to the playground. I relocated there this school year due to the addition of a fourth kindergarten class. In my five years of teaching, this is the second time I

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1 Although I conducted my research with real students, I have changed names in order to protect their confidentiality.
have taught in the portable. It has disadvantages, as it does not have bathrooms or a sink so
students use a water jug with a spout and a basin for cleanup. Research also took place outside of
the classroom via outdoor extension activities on or near school property.

**Data Collection Procedures and Instrumentation**

Data collection methods used in action research were especially relevant to my study
because the stages coincide with the Plan, Do, Study, Act method (P.D.S.A.) employed by my
school district. Appendix A, obtained from the Center for Collaborative Action Research,
illustrates this correlation. Several tools to helped me gather, disseminate and triangulate data
and situate my work in the real world. A journal, a camera/video recorder, the Plan, Do, Study,
Act tool (P.D.S.A.), a survey, worksheets and interviews helped me to keep track of the activities
in the classroom. The camera and video became an important way to record student interactions.
In addition, the survey and P.D.S.A. provided written responses that I could use to tally and
record results. For me, action research became a way to learn what was working and how
students were developing and learning throughout the unit.

*Journaling*: Journaling helped me keep track of the activities throughout my unit and
provided a record of student comments and interactions. It also helped me reflect on the progress
of the EE + Art unit, my teaching methods and resources, and to what degree students were
assimilating the material.

*Interviews*: Student interviews helped me assess their learning, confirmed what they were
or were not learning, and afforded students a voice.

*Observations*: Observation was a skill that I had to learn. Once I tuned in and listened to
student interactions, however, I found that students were quite articulate, that they enjoyed
discussing their opinions and that they were interested in the opinions of their classmates. My observations helped me gauge student learning and opinions about the unit.

*The Plan, Do, Study, Act Chart:* The P.D.S.A (see Appendix B) chart yielded responses that demonstrated some understanding of EE + Art and why we used recycled materials.

*The Survey:* I administered a condensed version of the Nature Relatedness Scale (see Appendix C). The Nature Relatedness Scale (Nisbet, Zelenski, & Murphy, 2009) is a tool that measures an individual’s level of affective, cognitive and experiential connectedness with the natural world. I used the Promethean ActiVote system to record and tally results. The ActiVote is a hand-held wireless Learner Response System. Teachers poll students at any time during class to assess progress and, based on responses, customize lessons to create a more personalized learning environment that is tailored to individual student needs” (Prometheanworld.com).

**Data Analysis Procedures**

Data analysis helped me make sense of my study by reflecting on the evidence I collected. The procedures I used to collect and analyze data for the length of my study included a Plan, Do, Study, Act (P.D.S.A.) chart (Appendix B), a survey (Appendix C), journaling, interviews, and observations.

The P.D.S.A. chart is a tool for measuring teaching and learning developed by my school district. The components are Plan (What are we going to learn?), Do (How are we going to learn it?), Study (What do the results tell us?) and Act (What will the teacher do to improve teaching and learning? What will the student do?). The chart helped me to clearly articulate the goals of my unit. Student responses helped me to recognize what went well and what did not.

The NR survey helped me to gather data before and after my unit. I administered the survey via the ActiVote system at the onset of the unit and at the conclusion compared and
contrasted responses to determine if EE made a difference in how students responded to the questions.

Journaling helped me evaluate and re-evaluate the activities in the art classroom by providing a written record of student interactions throughout the unit. Interviews helped me gauge student understanding and to what degree they were making connections between EE and art. Observation helped me scrutinize activities as I listened to student comments and reactions to the various EE + Art components to my study.

Limitations

Limitations of my study include the fact that some students may have answered survey questions because they thought there was a right or wrong answer or may have influenced one another’s opinions or views. Also, students may not have fully understood the survey questions. Site limitations included the lack of space to work on sculptural projects, and the fact that the portable does not have water or bathrooms. Another limitation that I did not anticipate was hunting season. Some students missed class due to hunting expeditions and seemed to come back from hunting with a different view regarding the suffering of animals. One student commented that he was a hunter, so he did not think about the suffering of animals.

Findings

For my study, I designed and implemented a fourth grade curriculum that merged environmental literacy with conceptual art projects. My intent was investigate how five key EE principles could combine with art making to inform students, challenge attitudes about the environment, foster environmental action and introduce the new dimension of conceptual art to students, culminating in an outdoor sculpture garden. Utilizing an action research approach in my inquiry, the following questions guided my investigation:
1. How can the five key Environmental Education components (awareness, knowledge, attitudes, skills and collective action) apply to the art classroom?

2. What negative human exploits and positive human achievements affect the environment?

3. How does art intersect with the environment?

My findings suggest that EE + Art are a good fit, that EE works to improve personal responsibility and art education intersects with the environmental education through the planning and creation of environmentally oriented conceptual works of art in the classroom. The remainder of this paper discusses these findings in more detail.

**Environmental Education and Art Education are a Good Fit**

I found the EE component to be a crucial element in my curriculum, as it informed and educated students about real-world and current environmental issues. Carefully chosen, current, and interesting resources about environmentalism and contemporary art practices heightened student interest and concern for the environment. My curriculum included an EE component based on the five principles articulated earlier², presented at the beginning of each lesson. Video clips, worksheets and discussion supported the EE principles present in my curriculum.

In turn, the EE component informed and influenced student artwork. Students made trash people from collected waste that became a learning tool as student photographers took them to various settings in and around the school. They gathered a following of students who questioned them about what they were doing. Students also made outdoor sculptures for the sculpture garden. The sculptures captivated the interest of parents, staff and visitors during the exhibition.

Through systematic study and collective art making I am convinced that students developed a comprehensive view of environmental issues and contemporary art making. I found

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² The five key components of EE are awareness, knowledge, attitudes, skills and collective action.
that students were interested and engaged in learning about important environmental issues that were relevant to their daily lives. Lively discussion and inquiry showed me that students were concerned about the issues presented. I assigned groups for all of the exposed environmental issues, we created concept maps, students worked together to report on findings and they made environmentally themed conceptual art. Through systematic study and collective art making it was apparent that students developed a comprehensive view of both environmental issues and contemporary art making. I found that students were attentive and absorbed in learning about important environmental issues relevant to their daily lives. Lively discussion and inquiry showed me that students were concerned about the issues presented.

Figure 2.1 is a concept map based on the worksheet “Follow the Waste Stream” and shows student understanding of what happens to recycled waste. Students learned about the amount of energy it takes to recycle and how important it is to use less as a first defense against excessive waste.

Figure 2.1. Follow the Waste Stream Concept Map

*Figure 2.1 shows what students learned about recycling and connections*
Environmental Education Works to Improve Personal Responsibility

One aspect of my study was the trash collection and categorizing activity (see Figure 3.1). This activity drew attention to the amount of trash in our own backyards. The activity helped students become aware of the consequences of a wasteful society. The 19 students on trash collection duty collected 438 pieces of trash in just ten minutes!

Figure 3.1. Categorizing Trash

*Figure 3.1 shows students analyzing trash and placing it into categories.*

Another aspect of my study involved looking at young people currently doing something to help the environment. Resources for this segment included:


*Kids Saving the Rainforest (KSTR):* This site is authored by kids who are doing something to help the environment and for kids who want to do more. Retrieved from [http://www.kidssavingtherainforest.org/](http://www.kidssavingtherainforest.org/)

*KSTR Wildlife Rehabilitation Center:* A program whereby school children adopt and care for displaced rainforest animals. Retrieved from

As we discussed the slide show from the KSTR Wildlife Rehabilitation Center, I found that students were especially concerned about animal species affected by deforestation and global warming. The images of orphaned animals really touched them and some students asked if there was anything similar in Casper. Students gained inspiration from the fact that other students adopted some of the animals as a class project. As we viewed Earth Day events sponsored by the PEA, students saw this as a way for them to promote EE at the school. They were impressed that the fair helps the environment rather than just talking about it through efforts to make the fair “zero-waste”. One student council member claimed that she was going to spearhead an Earth Fair at Manor Heights for Earth Day this year.

Students demonstrated an increased concern for environmental issues as my unit unfolded. As shown in Table 1.1, the NR Scale survey results, yielded some common trends. There was a general favorable increase in desired responses, except for a decrease in group B regarding question 5: I think a lot about the suffering of animals. Possible explanation for this could be that hunting season was in full swing here in Wyoming, and that is an important recreational activity, not typically viewed as animal friendly by environmental activists. I overheard one student say, “I am a hunter” when question 5 came up on the ActiVote screen and this may have influenced others. Table 1.1 details the results of the survey as administered before and after the unit of study.
Table 1.1 shows a general increase in favored responses after the unit, which demonstrates that EE principles made a difference in how students view their relationship to the environment.

Additional findings include students’ learning, as evidenced on EE worksheets and in video clips of them talking about environmental issues, which showed a real concern for their world and interest in learning about the environment.

In conclusion, study of human interaction with the environment helped students form opinions about where they stand and target areas where they could be involved. Throughout the unit, observations and student comments confirmed that students took EE concepts to heart. One student said, “I never thought about all the plastic water bottles, but I do now”! In addition,
survey results showed an overall increase in preferred responses to questions that targeted personal responsibility toward the environment.

**Art Intersects with the Environment**

Inclusion of the study of artists whose work connects EE to art was central to my curriculum because the artists we examined illustrate conceptual art. The first artist we studied was HA Schult via his website, “Art is Life” (http://www.haschult.de/). We discussed the artist’s trash people and how the trash people represent conceptual art because they are a critical reflection on a wasteful society. Then, based on the art of HA Schult, students made and photographed their own “trash people” in and around the school. The trash people appeared in various settings and as the photographers carried them around, the activity gathered interest from everyone who saw them. The following photos, as shown in Figures 4.1 and 4.2 show work by student photographers.

*Figure 4.1. Trash person playing*
Next, we studied the following artists whose works also conceptually connect EE + art.

**Andy Goldsworthy:**
(http://www.ucblueash.edu/artcomm/web/w2005_2006/maria_Goldsworthy/works.html)

**Vic Muniz:** (http://www.youtube.com/watch?v=6z66AT1Ap2g)

**Robert Smithson:** (http://www.robertsmithson.com/)

**Agnes Denes:** (http://agnesdenesstudio.com/)

These artists intensified the study of conceptual art. They were enamored with Andy Goldsworthy’s ice sculptures in particular. They really liked the video segment of “Earthworks” by Vic Muniz. As they began to plan their own conceptual works of art using recycled materials, I found that students were excited about making art from “junk”. One student commented that he
did not know you could “make art from stuff”. My website shows all of the students work from the planning stage to completion (see Figure 5.1) on the *Plans to Projects* page.

**Figure 5.1.** Screen shot of *Plans to Projects* page

![Image of student artwork](image)

*Figure 5.1. Details of student art work form the planning stage to completion illustrates critical thinking, communication, collaboration and creativity.*

Inspired by EE and the artists studied, students made 25 finished sculptures that were installed in the school courtyard and available for viewing during parent/teacher conference nights. The sculpture garden, as shown in Figures 6.1 and 6.2, gave students a chance to see how art can draw attention to and educate the public on environmental issues and it made them feel good about their art.
The sculpture garden was the grand finale to the unit. The following figures show the sculpture garden installed in the school courtyard.

*Figure 7.1. One view of the Sculpture Garden*

*Fig. 7.2. View 2 of the Sculpture*
The sign in register that I had put out to record visitor comments was a great tool to validate students’ work. I asked students how they felt about the comments from visitors and they indicated that they liked showing off their work because other people liked it. Figures 6.1 and 6.2 show student responses to visitor comments from the register.

Figure 6.1. Students Respond

Figure 6.1. Students responded to comments from the register on sticky notes.

Figure 6.2. More Students Respond

Figure 6.1. More students respond and share their feelings about the Sculpture Garden.
Summary Across all Findings

Looking at my study as a whole, I found that EE + Art can coexist as a unit of study by including both EE principles and contemporary art practices in the art classroom. I found that the tried and true principles of awareness, knowledge, attitudes, skills and action educated students’ about important environmental issues, invited inquiry, developed a sense of personal responsibility and informed students’ art making. The study of artists who demonstrate a concern for the environment through their work further illuminated students’ art. All of these outcomes are equally important because my goal was to merge EE and Art into a curriculum unit. Perhaps the most delightful outcome, however, was the artwork students created and how they felt about their sculptures. Students emitted a great deal of pride and satisfaction, and they felt that they had made a difference through their art. The following stories encapsulate what I observed about some of my students as they participated in this curriculum.

Stories

The following stories illustrate real-world learning and connections between EE + Art. I include them because they are telling examples of what I learned from students during my study.

Sam. Sam was always a quiet student who normally did just what was required but when he saw the stovepipe, football, and light bulbs in the cache of recycled items, he knew just what to do! He was the first student to create a plan, pitch his idea, claim the items he wanted and come back at recess begin making his idea a reality. His sculpture demonstrates an intuitive ability to put things together and his confidence in art reached a new level. I am anxious to see if this experience influences his future art practices.

Jean & Anne. These two girls were good students who always did their best work. They decided to make a fish tank, using a live fish that intended to show that fish require clean water
to thrive. Jean met me at PetSmart with her mother to pick out the fish. I made it clear that her
and her partner were to care for the fish or it would become available to someone else. Neither
student came in at all for a week and a half. After one final admonition, they still ‘forgot’ so I
had to make the fish available to someone else. They were upset about this and I was afraid that I
had alienated them but they came around when I suggested another project that would still
include living things but might be easier to care for. They became excited again and made a
wonderful terrarium. It was fun to watch them figure out how to plant- which one to put in first,
when to put the dirt in, and so on. What I learned from these students is that they learned from
the experience, and that they were willing to reinvent and devise a new project with positive
reinforcement and direction.

*Micky.* Micky had trouble getting started because she just could not come up with an idea
she liked….but then the fish came up for grabs! She quickly came up with her ‘fish in a frying
pan’ idea to bring attention to global warming. Micky attended the Saturday school and made her
sculpture in a couple of hours. She diligently came in three times a day everyday thereafter to
feed the fish and clean the jellybean jar tank she confiscated from her grandmother. What I
learned from Micky was that students need a project that excites them and that it is up to me to
provide that experience.

*Jake.* Jake had a great plan for a dryer vent, a mirror and a bicycle pump. He just could
not figure out how to make the pump move the dryer vent. He was working desperately, trying to
make his idea work when all of a sudden three other boys came to his rescue. They worked
together in a way that I not witnessed before. The boys brainstormed, experimented, and
ultimately solved the problem to a degree that was acceptable to Jake. Photo documentation of
this process can be found on my website. My committee members pointed out the fact that these
boys were exhibiting the 4C learning and innovation skills (critical thinking, communication, collaboration and creativity) outlined in the “Framework for 21st Century Learning” (Partnership for 21st Century Skills, 2011, p. 21). This added to my present enthusiasm and confirmed that my EE + Art unit was progressive and relevant to what is expected of today’s students because these students, along with others, demonstrated thinking that was purposeful, reasoned and goal directed.

Joe. This student did not get on board right away. I noticed that he held back a bit, not participating in discussions or interacting with other students a whole lot. The day I brought in a bleach bottle, a laundry detergent bottle and a pop bottle and suggested making animals with them, however, Joe he immediately lit up! He ended up making a turkey, a pig, a duck, 2 cows and a horse, much of them made during recess and at home over the weekend! He called it ‘The Recycled Animal Farm’ and even made a feeder out of a wet wipe container. He was the first to show up with his mom and brothers, taking care of the animals by rearranging them (he helped me set them up during recess on the big day) and feeding them by twisting off the caps (the mouth) and filling them with the popcorn that was in the feeder! Joe taught me that the unit afforded a level of creativity for the student that gave him confidence in his artistic abilities, pride in his work, and a level of engagement that he had not previously experienced.

Discussion and Conclusion

The intent of my study was to investigate how five key EE principles could inform fourth graders, challenge attitudes about the environment, foster environmental action and introduce a new dimension to students’ art making via making contemporary art such as trash people and sculptures using recycled materials. My literature review convinced me that the principles that drive environmental education could serve as a model for art educators who want to include
environmental art as an art form in their curriculum. I was satisfied that art that makes an environmental statement is a noble way to get students involved in their world. Many contemporary artists devote their life and art to the exploration and response to environmental problems and become educators through their art. Vic Muniz, for example, made art from trash collected at the world’s largest trash dump outside of Rio de Janeiro, as documented in the film, “Wasteland” (http://www.wastelandmovie.com/vik-muniz.html). Andy Goldsworthy is an artist and naturalist who makes art a part of nature, and nature a part of art (http://www.ucblueash.edu/artcomm/web/w2005_2006/maria_Goldsworthy/works.html). Still another artist was Robert Smithson, well known for his Earthworks. (Robertsmithson.com).

My conviction was also that environmental education could improve quality of life by providing students with strategies to solve and prevent environmental problems. I intended to show how contemporary art education could benefit by abiding by the environmental education principles of interdependency, sustainability and reflective perception of collective and individual behaviors.

For my study, I designed and implemented a fourth grade curriculum that included environmental literacy and environmental art projects. My intent was investigate how five key EE principles could inform students, challenge attitudes about the environment, foster environmental action and introduce a new dimension to students’ art, culminating in an outdoor sculpture garden. Action research allowed me to take my study to its fullest potential, make connections within the real classroom and gauge the effects of my unit. My study findings indicate that art education and art education can consistently work together to bring attention to environmental issues. When art and EE become equal partners with shared responsibility the goal of environmental literacy can become a reality sooner than later. showed that art education
and environmental education can consistently work together to bring attention to environmental issues. When art education and environmental education (EE) become equal partners with shared responsibility the goal of environmental literacy can become a reality sooner rather than later. I now believe that the five EE principles that I integrated into my art curriculum fit into the art classroom beautifully by situating responsible citizenry within art through study of environmental art and artists. Students demonstrated that they internalized EE concepts and made connections between EE + Art, as most were able to rationalize and explain their art via artist statements.

My study was progressive, informative, innovative and invigorating. Throughout the study, what struck me was that this was no ordinary art classroom. I enjoyed the sometimes chaotic, playful atmosphere. I was impressed with my students’ perseverance and attention through the long unit and I realized that as the focus shifted from the art making itself to the process of making art, students learned so much more. I required critical thinking to a level that I had not reached before in my teaching career. Some students complained at first, claiming that they could not figure out what to do. Some were impatient at how long it took to develop an idea and bring it to fruition. Others reveled in the thinking process and were contemplative. All were successful in the end. This unit can be a great addition in any classroom for the art teacher who wants to teach environmental concepts, get to know students, and work conceptually.

**Discussion and Interpretation of Findings**

Findings indicate that EE + Art can coexist and that students are capable of grasping EE concepts and transferring these concepts into a work of art. What I witnessed astounded me—lively discussions and interactions about environmental issues, thoughtful collaboration and problem solving and a sense of play. I interpreted, however, a negative and positive aspect of
play. Some students seemed to spend a lot of time ‘messing around’ and I found myself pressuring them to ‘do something’. Fortunately I caught myself, as I recognized that this way my issue, not theirs because I encouraged play and discovery throughout the unit. Ultimately, the students who I perceived as ‘goofing around’ surprised me in the end by pulling off a wonderful sculpture.

Looking at my findings, I realized that a common theme emerged; that students’ excitement about the unit spread to other students and staff as students shared what they were doing in the art room. This was perhaps the most rewarding finding, along with the fact that students demonstrated a great deal pride in their work. They talked about the unit with their families and friends, and shared their conceptual work with parents and siblings. There was a contagious atmosphere of excitement and interest that spread throughout the school during the unit as other students and staff heard about the goings on in the art room. This illuminated one thing that I learned from my literature review; namely how environmental art that takes environmental principles to heart can educate and influence the public. For indeed, the ecological crisis is one we should all own, and the crisis of sustainability affects all humans. A sustainable future includes environmentally sound, socially equitable, culturally sensitive and economically just education rooted in an environment of knowledge, interaction and change. A sustainable future comprises formal learning that is relevant to life outside school while addressing the problems of our world (United Nations Educational Scientific and Cultural Organization, 2012). Initially, I did not realize that this would be an outcome, but I am so delighted that school and community involvement became an important part of the study and this development influenced my decision to work toward getting the sculpture garden installed for parent/teacher conference nights.
In summary, I found that the five EE principles fit into the art classroom beautifully by situating responsible citizenry within art through study of environmental art and artists. One shortcoming to my study was that I was not able to determine whether the EE component will affect change in student attitudes and a measure of personal responsibility over time. All I can say for certain is that they made connections in the here and now.

Finally, I found that students did internalize EE concepts, as their conceptual art and artist statements demonstrate. Most were able to explain their art and how it related to the environment. Artist statements can be viewed on my website at

http://www.artandenvironment.weebly.com

Significance, Implications, and Recommendations

What stands out at the conclusion of my study is that this is just the beginning! I have had other grade levels ask me if they could make art using recycled materials, and at the sculpture garden debut, I had a former student express dismay (in her dramatic sixth grade manner) at not doing this when she was in fourth grade. The EE and art components were equally significant parts of the study. While EE provided the knowledge needed to tackle environmental issues, environmentally themed art provided the inspiration for art projects. My study showed strong implications that by including EE in an art curriculum; students develop environmental literacy and demonstrate understanding of environmental concepts, making connections through their art.

EE + Art as a curriculum unit may or may not be a viable path for all art teachers. It certainly did what I hoped it would do, however. It informed students about environmental issues, created a measure of personal responsibility for the environment and resulted in conceptual works of art that made an environmental statement, while drawing attention to environmental concerns.
Conclusion

My study provides a basis for other art educators who want to include environmental education in their curriculum by laying the groundwork and authenticating this kind of unit. A unit of this scope, however, takes extra time and effort. It is not for the faint of heart! Our school social worker commented to me one day that the sculptures were so unique and asked how I managed to pull it off. I replied that it was a rewarding experience. She said that she had not heard a teacher say that in a long time. Perhaps we get stuck in a rut, teaching the same lessons repeatedly. Perhaps its time for change and to take art teaching to a new dimension by including EE + Art.
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Appendix A

Progressive Problem Solving with Action Research

# Appendix B

**PDSA (Recycled Sculpture)** A measurement tool for teaching and learning

<table>
<thead>
<tr>
<th>Plan</th>
<th>Study: What do the results tell us?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>What are we going to learn?</strong> EE principles and how they apply to art making. Create art from recycled materials that makes a statement about environmental issues. Learn about conceptual art (art that conveys concepts: art designed to present an idea rather than to be appreciated for its creative skill or beauty, often making use of unconventional media).</td>
<td>+ (plus)</td>
</tr>
<tr>
<td><strong>Learning Targets:</strong></td>
<td></td>
</tr>
<tr>
<td>- 21st Century Learning Skills: critical thinking, communication, collaboration &amp; creativity</td>
<td>- Ms. Ray let us stay in at recess</td>
</tr>
<tr>
<td>- Conceptual art based on EE principles</td>
<td>- So many things to pick from</td>
</tr>
<tr>
<td>- Artist statement (articulation of your art)</td>
<td>- Ms. Ray helped us</td>
</tr>
<tr>
<td><strong>Do</strong></td>
<td><strong>I liked how we are helping the world</strong></td>
</tr>
<tr>
<td><strong>How do we plan to learn it?</strong> Study EE concepts, study environmental art &amp; artists, create sculpture garden, practice skills, experiment with alternate materials to get desired results.</td>
<td><strong>I like how Peyton &amp; I are working together</strong></td>
</tr>
<tr>
<td><strong>Learning Practices:</strong></td>
<td><strong>It was fun, I liked using spray paint</strong></td>
</tr>
<tr>
<td>Teacher will . . .</td>
<td><strong>I liked it because I was doing it with my friend</strong></td>
</tr>
<tr>
<td>- Model</td>
<td><strong>I made my sculpture out of bottle caps</strong></td>
</tr>
<tr>
<td>- Give feedback, encourage learning skills</td>
<td><strong>It was fun</strong></td>
</tr>
<tr>
<td>- Provide materials, resources and examples</td>
<td><strong>I liked getting to use creativity, its really fun</strong></td>
</tr>
<tr>
<td>- Provide extra time in art room</td>
<td><strong>I liked that we recycled a lot of things</strong></td>
</tr>
<tr>
<td>Students will . . .</td>
<td><strong>I liked painting with partners</strong></td>
</tr>
<tr>
<td>- Participate in group or personal project of choice</td>
<td><strong>I liked it because I have never done it before</strong></td>
</tr>
<tr>
<td>- Make art and artist statement</td>
<td><strong>It helps the world and turns into something cool</strong></td>
</tr>
</tbody>
</table>

- I liked it because it was hard and it was fun
- You can see a lot of other trash that can be cool
- I liked it because you can build or paint it any way you want
- It was fun picking out of all the recycled stuff
- I liked the experience of making it
- It makes the world more cleaner
- I liked the challenge that it was to put the stuff together
- I liked all the nature
- I feel ok about recycled art, it was fun
- I like steel
- It’s clever
**Study: + (plus) continued**

- I love to recycle!
- I want to do it again
- Designing
  - I liked putting things together
  - I liked mine because it spins
  - I liked all of it
- It was the best thing ever, I didn’t know you could make art from stuff
  - I liked the experiments with water and the tree- it was fun to use the heat gun
- You got to choose what you did and how to make it
- I liked that you got a lot of choices
- It was cool how the colored water stuck to the tree with soap
- I likes building the sculpture because it was hard
- It was a wonderful collection of trash, fun to use the hair gel
- I liked that we made wheels
- There was a lot of plastic

**Study: - (delta)**

- It was really hard
- It took a long time
- It was dirty, I didn’t like all the smelly items – using dirty trash
- I did not like the gluing
- I had to keep restarting my project like 3 times
- The first time we started to do our sculpture we had to start over because everyone took the stuff we wanted to use
- There was so much garbage
- It was super hard to make
- We spent a lot of time doing it
- The fish was hard to take care of- he was getting harassed
- A lot of pieces were bent
- Making it took forever
- It was hard to build, I didn’t know how
- It was hard to think of ideas that I can do
- We kept having to change project
- I didn’t like it because it didn’t turn out the way I wanted it to
- My partners didn’t let me say anything

---

**Act**

**What will we do differently in our next learning cycle?**

**Teacher will:**
- Organize materials into categories
- Anticipate supporting materials such as various paint colors and have a table for painting with materials on hand
- Change first planned gets first pick- this inhibited slower workers
- Get more volunteers to make the process go more quickly

**Students will:**
- Recognize that sculptural art takes more time
- Utilize the resource packet to problem solve before asking for help
- Take responsibility for clean up
Appendix C

NR Scale Unit Beginning

<table>
<thead>
<tr>
<th>Nature means alot to me</th>
<th>Q1</th>
<th>88% yes 12% no</th>
<th>92% yes 8% no</th>
</tr>
</thead>
<tbody>
<tr>
<td>I always think about how my actions affect the environment</td>
<td>Q2</td>
<td>31% yes 69% no</td>
<td>46% yes 54% no</td>
</tr>
<tr>
<td>My relationship to nature is an importaht part of who I am</td>
<td>Q3</td>
<td>51% yes 39% no</td>
<td>53% yes 37% no</td>
</tr>
<tr>
<td>I am very aware of environmental issues</td>
<td>Q4</td>
<td>42% yes 58% no</td>
<td>58% yes 42% no</td>
</tr>
<tr>
<td>I think alot about the suffering of animals</td>
<td>Q5</td>
<td>90% yes 10% no</td>
<td>92% yes 8% no</td>
</tr>
<tr>
<td>Humans have the right to use natural resources any way we want</td>
<td>Q6</td>
<td>50% yes 50% no</td>
<td>50% yes 50% no</td>
</tr>
<tr>
<td>Conservation efforts are important to help nature recover from human impact</td>
<td>Q7</td>
<td>80% yes 20% no</td>
<td>81% yes 19% no</td>
</tr>
<tr>
<td>Animals, birds and plants have fewer rights than humans</td>
<td>Q8</td>
<td>70% yes 30% no</td>
<td>62% yes 38% no</td>
</tr>
<tr>
<td>Some species are meant to die out and become extinct</td>
<td>Q9</td>
<td>78% yes 12% no</td>
<td>73% yes 27% no</td>
</tr>
<tr>
<td>I can't solve environmental problems</td>
<td>Q10</td>
<td>43% yes 57% no</td>
<td>38% yes 62% no</td>
</tr>
<tr>
<td>I like being outdoors whenever I can</td>
<td>Q11</td>
<td>95% yes 5% no</td>
<td>100% yes</td>
</tr>
<tr>
<td>I notice wildlife wherever I am</td>
<td>Q12</td>
<td>76% yes 24% no</td>
<td>81% yes 19% no</td>
</tr>
</tbody>
</table>
NR Scale Unit End

Survey Results

<table>
<thead>
<tr>
<th></th>
<th>Group A</th>
<th>Group B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>89% yes 11% no</td>
<td>90% yes 10% no</td>
</tr>
<tr>
<td>Q2</td>
<td>68% yes 32% no</td>
<td>35% yes 65% no</td>
</tr>
<tr>
<td>Q3</td>
<td>68% yes 32% no</td>
<td>70% yes 30% no</td>
</tr>
<tr>
<td>Q4</td>
<td>64% yes 36% no</td>
<td>50% yes 50% no</td>
</tr>
<tr>
<td>Q5</td>
<td>88% yes 12% no</td>
<td>65% yes 35% no</td>
</tr>
<tr>
<td>Q6</td>
<td>21% yes 79% no</td>
<td>70% yes 30% no</td>
</tr>
<tr>
<td>Q7</td>
<td>75% yes 25% no</td>
<td>90% yes 10% no</td>
</tr>
<tr>
<td>Q8</td>
<td>43% yes 57% no</td>
<td>60% yes 40% no</td>
</tr>
<tr>
<td>Q9</td>
<td>64% yes 36% no</td>
<td>50% yes 50% no</td>
</tr>
<tr>
<td>Q10</td>
<td>79% yes 21% no</td>
<td>20% yes 80% no</td>
</tr>
<tr>
<td>Q11</td>
<td>93% yes 7% no</td>
<td>100% yes</td>
</tr>
<tr>
<td>Q12</td>
<td>82% yes 18% no</td>
<td>85% yes 15% no</td>
</tr>
</tbody>
</table>
### Appendix D

#### UFIRB 02 – Social & Behavioral Research

**Protocol Submission Form**

*This form must be typed. Send this form and the supporting documents to IRB02, PO Box 112250, Gainesville, FL 32611. Should you have questions about completing this form, call 352-392-0433.*

<table>
<thead>
<tr>
<th>Title of Protocol:</th>
<th>Environmental Literacy in Art Education: How can Environmental Education Principles Benefit an Art Curriculum?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principal Investigator:</td>
<td>Barbara Ray</td>
</tr>
<tr>
<td>UFID #:</td>
<td>5379-2914</td>
</tr>
<tr>
<td>Degree / Title:</td>
<td>MA Art Ed</td>
</tr>
<tr>
<td>Mailing Address:</td>
<td>111 N. Forest Dr. #50 Casper, Wy 82609</td>
</tr>
<tr>
<td>Email:</td>
<td><a href="mailto:Mountain_jewelry@yahoo.com">Mountain_jewelry@yahoo.com</a></td>
</tr>
<tr>
<td>Telephone #:</td>
<td>(307) 202-1322</td>
</tr>
<tr>
<td>Co-Investigator(s):</td>
<td>none</td>
</tr>
<tr>
<td>UFID#:</td>
<td></td>
</tr>
<tr>
<td>Email:</td>
<td></td>
</tr>
<tr>
<td>Supervisor (If PI is student):</td>
<td>Elizabeth Delacruz</td>
</tr>
<tr>
<td>UFID#:</td>
<td></td>
</tr>
<tr>
<td>Degree / Title:</td>
<td></td>
</tr>
<tr>
<td>Mailing Address: (If on campus include PO Box address):</td>
<td></td>
</tr>
<tr>
<td>Email:</td>
<td></td>
</tr>
<tr>
<td>Telephone #:</td>
<td></td>
</tr>
<tr>
<td>Date of Proposed Research:</td>
<td>FA 2012</td>
</tr>
<tr>
<td>Source of Funding (A copy of the grant proposal must be submitted with this protocol if funding is involved):</td>
<td>none</td>
</tr>
<tr>
<td><strong>Scientific Purpose of the Study:</strong></td>
<td>The objective of my research proposal is to advocate a new approach to art education that emphasizes environmental literacy. The aim of my research is to describe the ways in which environmental education principles can enhance art education by exploring successful cases of application.</td>
</tr>
<tr>
<td><strong>Describe the Research Methodology in Non-Technical Language:</strong></td>
<td></td>
</tr>
</tbody>
</table>
I plan to use a case study approach, utilizing a survey and observation techniques to determine the effects of applying environmental education principles to a public school art curriculum. The study will take place in my own classroom and will consist of 2 fourth grade classes with an anticipated count of not more than 60 students. The setting will be a public school system in Natrona County, Casper, Wyoming. Data collection will include a survey, a Plan, Do, Study Act (PDSA) method as required by my district, observation and photos and of student work, as well as the art project included in the curriculum. The art project will be included temporarily in the nature walk area on school grounds.

Describe Potential Benefits:

- Environmental literacy
- Increased environmental awareness for students and others

Describe Potential Risks: (If risk of physical, psychological or economic harm may be involved, describe the steps taken to protect participant.)

I am not aware of any risks

Describe How Participant(s) Will Be Recruited:

Participants will include classroom students already assigned to me

<table>
<thead>
<tr>
<th>Maximum Number of Participants (to be approached with consent)</th>
<th>60</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age Range of Participants: 9-10 years of age</td>
<td></td>
</tr>
<tr>
<td>Amount of Compensation/course credit:</td>
<td></td>
</tr>
</tbody>
</table>

(SIGNATURE SECTION)

Principal Investigator(s) Signature: Date:

Co-Investigator(s) Signature(s): Date:

Supervisor’s Signature: Date:

Department Chair Signature: Date:
Appendix E

Manor Heights Elementary Parental Consent Form

Dear Parent/Guardian,

I am a graduate student in the Department of Art Education at the University of Florida, conducting research on Environmental Literacy in Art Education. Environmental literacy is a fundamental understanding of the systems of the natural world, the relationships and interactions between the living and the non-living environment, and the ability to deal sensibly with problems that involve scientific evidence, economic, aesthetic, and ethical considerations. The purpose of this study is to compare the student's comprehension of environmental issues and art before and after being taught environmental principles. The results of the study may support other art educators who wish to introduce environmental education into the art classroom and allow them to design instructional practices accordingly. These results may not directly help your child today, but may benefit future students. With your permission, I would like to ask your child to volunteer for this research.

The fourth grade curriculum unit will be implemented within the first 9 weeks of the 2012 school year and will include an educational component and an environmental art project. I will record observations, and collect data by administering a survey before and after the unit. The survey will be anonymous. Participation or non-participation in this study will not affect the children's grades or placement in any programs.

You and your child have the right to withdraw consent for your child's participation at any time without consequence. There are no known risks or immediate benefits to the participants. No compensation is offered for participation. Group results of this study will be available in December upon request. If you have any questions about this research protocol, please contact me at (307) 202-1322 or my faculty supervisor, Dr. Elizabeth Delacruz, at edelacruz@ufl.edu. Questions or concerns about your child's rights as research participant may be directed to the IRB02 office, University of Florida, Box 112250, Gainesville, FL 32611, (352) 392-0433.

Sincerely,

Barbara Ray

Manor Heights Art Teacher

I have read the procedure described above. I voluntarily give my consent for my child, ______________________, to participate in Barbara Ray's study of Environmental Literacy in Art Education. I have received a copy of this description.

______________________________  Parent / Guardian Date

______________________________  2nd Parent / Witness Date
Appendix F

IRB-02:

Assent Script

Fourth Grade Students,

Hello [child’s name]. For those of you who don’t know me, I am Ms. Ray. I have taught art at Manor Heights for the past four years and I am also a graduate student at the University of Florida. This first nine weeks of school we will be studying art and the environment. If you decide to participate, you will be asked to complete a 12 question survey before and after we study the environment. There are no known risks to participation. You do not have to be in this study if you don’t want to and you can quit the study at any time. Other than the researchers, no one will know your answers, including your teachers or your classmates. If you don’t like a question, you don’t have to answer it and, if you ask, your answers will not be used in the study. I also want you to know that whatever you decide, this will not affect your grades in class. Your [parent / guardian] said it would be OK for you to participate. Would you be willing to participate in this study?
List of Figures and Captions

Figure 1.1. Chart obtained from the Campaign for Environmental Literacy website

Figure 2.1 Follow the waste stream concept map

Figure 2.2 Global warming concept map

Figure 3.1. Categorizing trash

Figure 4.1. Trash person playing

Figure 4.2. Trash person playing

Figure 5.1. Screen shot of plans to projects page

Figure 6.1. Student responses

Figure 6.2. More student responses

Figure 7.1. View 1 of the sculpture garden

Figure 7.2. View 2 of the sculpture garden
Author Biography

Barbara J. Ray

*Educational Accomplishments*

MA Art Education • University of Florida, Gainesville • Graduation Date, Dec. 2012
BA Art Education • Montana State University, Billings • Graduated Cum Laude, May 2008
AAS Graphic Design • Northwest College, Powell, WY • Graduated with Honors, May 2004

*Workshops*

Peters Valley Craft Center (metals) 2009
Revere Academy of Jewelry Arts (stone setting certificate) 2004
Arrowmont School of Arts and Crafts (metals) 2003, 2004

*Work Experience*

Art Teacher • Casper, WY • 2008-present
Practicing Studio Artist • 1980-2008
Picture Me! Portrait Studio Photographer • May 2008-October 2008

*Other Experience*

Published Illustrator • "Natrona County- The Place We Call Home", 2011
Studio Assistantship (metals) • Haystack Mtn. School of Crafts- 2008
Artist in Residence • Growth Thru Art • Billings, MT- 2007
Studio Assistantship (metals) • Arrowmont School of Arts & Crafts - 2005
Big Brothers, Big Sisters of Park County, WY- 2000
AmeriCorps National Service Organization, WY- 1998
• Awards •

2012 National Arts Council • Casper, WY • Third Place - Jewelry

2009 Miniature Show • Casper, WY • Honorable Mention - Jewelry

2007 William Garrison Exhibit • Garrison Award for Exceptional Work - Jewelry

2007 Student Independent Art Show • MSU Billings • Best of Show - Jewelry

2004 Creations from Within’ Competition • Laramie, WY • Second Place - Jewelry

2004 Wyoming Artisans Grant recipient • $13,500 award

2004 Juried Art Show • Northwest College • President’s Purchase Award - Jewelry