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A Qualitative Study: Integrating Art And Science In The Environment

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**A QUALITATIVE STUDY:
INTEGRATING ART AND SCIENCE IN THE ENVIRONMENT**

by

DEBORAH N. MILLS

DISSERTATION

Submitted to the Graduate School

of Wayne State University,

Detroit, Michigan

in partial fulfillment of the requirements

for the degree of

DOCTOR OF PHILOSOPHY

2013

MAJOR: EDUCATIONAL RESEARCH
AND EVALUATION

Approved by:

Advisor

Date

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DEDICATION

This dissertation is dedicated to the generation that came before me and made this possible.

My father, Bartholomew J. Naughton,

my mother, Doris L. Naughton,

my aunt, Helen Lasslett, and

my mother-in-law Nina V. Mills.

Their support and encouragement helped me believe in myself.

I wish they were here to see me finish.

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Without the permission and ongoing support of my school district's superintendent, assistant superintendent, school board, principle, assistant principals, science teacher, tv production teacher, attendance paraprofessional, and the students who participated, this study would not have been possible.

There are special people in my life who always believed in me even when I struggled to believe in myself, my husband, John C. Mills, my son, Bryan N. Morgan, and dear friends, Marian Angeli and Lucy Bates. I would also like to thank my sister, Kathleen Glezen, for always having my back and my brother, Bartholomew J. Naughton Jr., for always being my friend. Special thank you, to June Cline for her help and encouragement during this process. A special thanks to Claude, Jessica, and Gené Vieve for providing distractions when I needed them most. Thank you all, I could not have done this without each and every one of you.

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CHAPTER 1

INTRODUCTION

Background

Art education has experienced many theoretical changes on how to best educate children in the arts. In the 1960s and 1970s, the purpose of art education, according to Lowenfeld and Brittain (1987), was to develop creativity that could transfer to other subjects and human activity. The role of art education became a way for students' to develop creative self-expression and not as an end in itself. All students, not just those who were artistically talented, were encouraged to develop their creative abilities over time (Lowenfeld & Brittain, 1987). Lowenfeld and Brittain's focus was on creative self-expression as a form of an individual's personality, as well as development of relationships and identity formation. In any art program, interactions between art teachers and students prove important; however, Lowenfeld and Brittain asserted that teacher intervention should be minimal in the early stages of a child's education. As students become older and they build skills through their own experiences with materials, direct teacher intervention becomes more valuable to communicate knowledge and develop a greater understanding of the creation of art (Lowenfeld & Brittain, 1987).

Lowenfeld and Brittain (1987) believed creative and mental growth occurred in stages: scribble (2 to 4), preschematic (4 to 6), schematic (7 to 9), dawning realism (9 to 11), and pseudorealistic stage (11 to 13). Each of the five stages consider the social, emotional, perceptual, intellectual, aesthetic, and creative components of children in the particular age groups (Zimmerman, 2009). Children pass through the stages similarly and more or less at the same age. The focus was on students' experiences with minimal concern for the effect of a students' culture or influences of other cultures, including contemporary culture. Lowenfeld and

Brittain (1987) argued that it was only in adolescence that social influences played a role in creative development.

The reaction to Lowenfeld and Brittain's (1987) child-centered emphasis was discipline-based art education (DBAE). DBAE supporters during the 1980s established a curriculum reform movement with DBAE's four specific disciplines; (a) aesthetics, (b) art criticism, (c) art history, and (d) art production; that were aligned with social and economic trends of the time. DBAE received support from the Getty Center for Education in the Arts. As a result, DBAE became the model for art education programs in the United States. DBAE presented about the same time as the standards and rubric movement began to dominate education.

Art education did not escape the reform movement, with art education now being assessed using standardized measures. DBAE was the reaction to Lowenfeld and Brittain's child-centered approach (Smith, 1996). The title of a 1985 report by the J. Paul Getty Trust, *Beyond Creating: The Place for Art in America's Schools*, assured by its title that the educational goal is not focused on creativity but on a curriculum that is measurable. Students were expected to develop an understanding of art and be exposed to experiences that would enhance their learning. DBAE's sequential, cumulative, articulated, and district-wide implementation assumed that all students' needs and backgrounds could be assessed similarly (Zimmerman, 2010). She argued that what was not considered was that students come from diverse backgrounds in which socioeconomic status, gender, culture, and racial differences play important roles in creative expression.

Student skills, knowledge, and understanding were standardized, and end products were predetermined and formalized through a district-wide and state curriculum. Underlying DBAE's assessment initiatives was the belief that student progress should be measured using pre-set goals to affirm that the program was able to meet rubrics and other outcomes established by outside experts

(Zimmerman, 2010). Clark (1991) reexamined DBAE and wrote that although DBAE presented specific art content to be learned, it did not include “student self-expression, levels of student development, and their readiness to learn; teachers’ role and methodologies related to learning in the arts; and specific educational settings” (p. 19).

Art education today seems to lack an over-arching theory that provides a foundation on which to build a curriculum. With the loss of more than 25% of public school art programs due to budget constraints (“10 Salient Studies on the Arts in Education,” 2011), the focus of art education is on attempts to defend its existence. Numerous studies have been published to support the need for the arts in schools:

A 2002 report by the Arts Education Partnership revealed that schoolchildren exposed to drama, music and dance are often more proficient at reading, writing, and math. (p. 1, para.2)

The 2006 Solomon R. Guggenheim Museum study on art education showed a link between arts education and improved literacy skills. (p. 2, para 2)

A 2005 report by the Rand Corporation called “A Portrait of the Visual Arts” argues that art education does more than just give students a creative outlet. It can actually help connect them to the larger world, ultimately improving community cohesion (p. 2, para 4).

These studies provided empirical support for the inclusion of arts programs in schools to assist core subjects of math, science, language arts, and history, but failed to support the value of the arts for their own merits.

Standards and benchmarks developed by governmental education agencies are the theoretical foundation on which today’s art education curriculum is based. An open-ended approach to art education requires students to have the ability to perform, create, evaluate, understand, analyze, and describe art in its historical, social, and cultural context. Students need to develop the ability to recognize, analyze, and describe connections between the arts and other

disciplines; as well as between the arts and everyday life (Michigan Department of Education [MDE], 1998).

Unlike the previous two art education theories, specific information on achievement standards or how these standards are to be accomplished is not provided. Teachers are offered instructional materials to assist with lesson planning that can meet the requirements of the standards and benchmarks that assure student success. However, attaining and assessing student success is left to teachers.

The use of the immediate environment in teaching art has the potential to help the student and teacher attain a level of success in all five standards identified by the state of Michigan. The environmental influence on creativity and learning has been explored by many different disciplines. Educators, naturalists, architects, industrial designers, and others have studied environments to assess the learning and creative influence it has on its inhabitants.

A number of these disciplines have attempted to control or manipulate the environment, hoping to enhance the creativity and learning that takes place in them. Others have taken a more “hands-off” approach, feeling that by simply existing in the environment, the creative and learning experience can be improved.

Evolution of Qualitative Research

The “Chicago school” began to identify the importance of qualitative research in the study of human group life (Denzin & Lincoln, 2005). Chicago school sociologists saw the significance of seeing the world from the perspective of those to whom society rarely listened (Bogdan & Bilken, 1982). About the same time, in anthropology, a defined fieldwork discipline was being developed with the studies of Mead, Evans, Boas, and others (Gupta & Ferguson, 1997). The study of group life by sociologists and fieldwork of anthropologists were integrated

to produce a common methodology that provided solutions that minimized the weaknesses of each. Humanists looked to social science for new ways to study popular culture in local contexts. Social science began to create informational texts that were less linear and provided a fuller understanding of the context from which studies came (Smith & Hodkinson, 2005).

In the 1960, a division between qualitative and quantitative research approaches became evident. Quantitative research was grounded in science, with qualitative research using a humanistic approach to studying groups of people (Denzin & Lincoln, 2005). A number of historical moments occurred in the evolution of qualitative research, many of which overlap. Traditional (1900-1950), modernist (1950-1970), blurred genres (1970-1986), crisis of representation (1986-1990), postmodern (1990-1995), postexperimental inquiry (1995-2000), methodologically-contested present (2000-2004), and fractured future (2005-present; Denzin, Lincoln, 2005). Denzin and Lincoln (2005) argued that at the core of every evolution is a grounded definition that:

Qualitative research is a situated activity that locates the observer in the world. It consists of a set of interpretive, material practices that make the world visible. These practices transform the world. They turn the world into a series of representations, including field notes, interviews, conversations, photographs, recordings, and memos to the self. At this level, qualitative research involves an interpretive, naturalistic approach to the world. This means that qualitative researches study things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them. (p. 3)

As part of the nature of qualitative research and its history of multiple disciplinary interactions, opportunities are afforded to study all areas of human interaction, including the physical sciences. Because of the availability of multiple research methods used by qualitative researchers, this type of research often is viewed as unscientific, exploratory, or subjective. Qualitative research often is called criticism rather than theory or science, or is interpreted

politically, as a disguised version of Marxism or secular humanism (Huber, 1995). Hard sciences assumed that “truth” transcends opinion and bias (Carey, 1989).

In recent years, scientifically-based research (SBR), supported by the National Research Council (NRC), has become the driving force for the federally-legislated No Child Left Behind Act of 2001. This positivist, evidence-based movement expects researchers to use “rigorous, systematic, and objective methodology to obtain reliable and valid knowledge” (Ryan & Hood, 2004, p 80). Well-defined causal models, along with independent and dependent variables, are used by researchers to examine educational reform issues in the context of randomized controlled experiments that allow for reproduction and generalization of results (Ryan & Hood, 2004, p. 81). With this type of research considered the preferred standard, qualitative research is suspect as there are no required well-defined variables, casual models, reproducible or generalized results.

Researchers, opposed to the SBR movement, consider it to be a backlash to the 20 years of continued growth in the use of qualitative research (Denzin & Lincoln, 2005). The SBR movement embraced a narrow view of science (Maxwell, 2004) that was consistent with “neoclassical experimentalism” of the Campbell-Stanley era and its dogmatic and exclusive reliance on quantitative methods (Howe, 2004). SBR reflects “nostalgia for a simple and ordered universe of science that never was” (Popkewitz, 2004, p. 62)

Qualitative researchers focus on the socially constructed nature of reality, relationships between the researcher and what they are studying and how the environment shapes the research (Denzin & Lincoln, 2005). Researchers are trying to understand how experiences are created and why they have meaning. Because my research seeks to develop an understanding of how experiences between student and place, student and environment, student and materials create

meaning, a qualitative research approach using participant observation in a natural setting to gather descriptive data support the rational for the use of a qualitative approach.

A growing number of scholars have argued for the need of an interpretive mode of research in the arts (e.g., Eisner, 1991, 1993, 1997; Howe, 1998; Schwandt, 1989, 1999), with additional experts indicating that arts-based research in education is a specific genre (e.g. Barone, 1995; Barone & Eisner, 1997; Finley & Knowles, 1995). This increased interest is present in the growing body of literature found under the heading of arts-based educational research, the formation of an Arts-Based Educational Research Special Interest Group under the American Educational Research Association (1999), and an increasing number of forums such as *Qualitative Inquiry*, that are providing examples of arts-based studies and discussing methodological concerns associated with this approach (Piantanida, McMahon, & Garman, 2003).

Qualitative Research in Art Education

Arts-based educational research is a mode of inquiry incorporating art, education, and research that has the potential for being misunderstood because of the manner in which data collection, analysis and presentation extends beyond the accepted notions of research (Labaree, 1998). Articulating a philosophy grounded in logic, along with the justification for one's work, helps guard against such criticism (Piantanida, McMahon, & Garman, 2003). A paradigm shift identified by Lincoln (1995):

It [qualitative research] is scientific inquiry that embraces a set of three new commitments: first to new and emergent relations with respondents; second, to a set of stances – professional, personal, and political – toward the uses of inquiry and toward its ability to foster action; and finally, to a vision of research that enables and promotes social justice, community, diversity, civic discourse, and caring. (pp. 277-278).

Lincoln developed a set of five standards based on the three commitments for writing new paradigm research. The new paradigm considers;

- inclusion of author's own background to develop an understanding of conclusions drawn (positionality);
- developing relationships with those involved in the research (community);
- engaging and including persons who might otherwise be silenced or marginalized (voice);
- researchers' understanding of their psychological and emotional impact before, during, and after the research experience (critical subjectivity or reflexivity);
- an open and sharing relationship between researchers and participants (collaborators) in all research (reciprocity; Finley, 2003, p.282).

Lincoln's research paradigm, as action-based inquiry, takes form through well-developed interpersonal, political, emotional, moral, and ethical relationships that are developed and shared between researchers and participants. Lincoln's paradigm was not prescriptive, but was a way of analyzing emerging qualities in the development of human inquiry related to arts-based educational research.

With the inclusion of the ethics of Lincoln's (1995) paradigm associated with arts-based educational research, standards emerged for methodological processes and products of qualitative inquiry. According to Lincoln (1995), this inquiry began to embrace a set of standards that have a relationship to:

1. Community: developing and nurturing democratic relationships between the researcher and participants, sharing a commitment to understanding social life;
2. Action within community: engaging in research work that is useable and responsive to local cultural and political issues and takes a stand against social injustice (Denzin, 2000);

3. Visionary critical discourses: conducting research that examines not only how things are, but envisions how they could be.

With the historic, grounded, and structured qualitative research approach combined with arts-based educational research, Lincoln's (1995) paradigm evolved from the work of established qualitative researchers. The present study is an opportunity for arts research to continue to grow as a field unto its own. This study presents an opportunity for arts-based research to develop further by focusing on artistic thinking, creativity, concept, and research in addition to technical skills. Student artwork is viewed as a learning opportunity and provides evidence that learning is taking place rather than being an aesthetic end in itself. The project is student driven. While the teacher provides general parameters for the art project, the students are free to be creative in developing their works. They are motivated by their interests as they become more involved in the learning exploration. Because research is a major focus that is used in the creation of the art product, students are encouraged to explore diverse areas, such as artistic methods, content, process, culture, history, nature, reoccurring themes, and relationships between art and the environment (Marshall & D'Adamo, 2011). This study investigated the different ways of thinking and learning that students discover through the making of an art project that involves the environment.

Statement of the Problem

The problem that was investigated in this study was to determine which individual elements of three environmentally-centered disciplines of place-based education, Reggio Emilia Approach, or experience design, support and/or enhance students' ability to expand their creativity to learn and to have memorable experiences. While many possible elements might be examined, this study focused on the foundational elements of the three disciplines. For example,

elements associated with student involvement in place-based education, Reggio Emilia, and experience design in curriculum development were blended using interview responses, student journals, and researcher field notes.

Purpose of the Study

The purpose of this study was to develop an understanding of the nature of a creative learning experience that incorporated the foundational elements of these different disciplines. As becomes clearer in what follows in Chapter 2, research questions included:

1. What is the nature of the creative learning experience?
2. To what extent might these experiences incorporate the environment and encourage creativity?
3. To what extent might such experiences offer opportunities for collaboration of students in developing the educational outcomes? and
4. To what extent might such experiences support students to develop partnerships with the environment and allow alternative uses for a product?

Significance of the Study

If the inclusion of elements from place-based education, Reggio Emilia approach, and experience design can help learners attain a higher level of understanding, a commitment to a need to know approach, and an aesthetic sense of symmetry, order, and beauty, then the incorporation of these elements should provide learners with greater experiences and growth (Maslow, 1943).

Some schools and students are struggling more so now than ever before. The discovery and integration of key arts designed-based elements, once identified as beneficial, may help some of these schools succeed in educating their students. This may be done by enhancing

creativity and growth initially, with the long-term intention being to lay a foundation for continuous creative growth and personal development. Minimizing or eliminating the number of struggling schools and students might have a profound influence on education, as well as individuals and, by extension, all of society.

Definition of Terms

The following definitions, developed by the researcher, except if accompanied by a citation, are provided to ensure a uniformity and understanding of these terms throughout the study.

Creativity: The ability to transcend traditional ideas and develop new, meaningful, and ever-changing ideas.

Eco-Justice: Reform of the existing Western approach in an attempt to assure future generations an environment that has not been diminished by greed and materialism, but honors the culture in which it exists (Bowers, 2001).

Environment: All social, cultural, and physical elements with which people come into contact.

Experience: The creation of meaning and value for people as the result of an interaction (Norman, 2009).

Learner: People engaged in educational settings, which may include teachers as well as students.

Learning: On-going exchange of ideas and experiences between people, educators, learners, and environments.

Product/artifact: An object that is intended to help the user have memorable experiences in his environment (Chochinov, 2009).

Experience-Designers: maintain a balance between the need and sustainability of a product/artifact, the inclusion of the user in an on-going design process, and simply-designed product/artifacts which support a unique experience for the user.

User: People who interact with product/artifacts.

Limitations of the Study

This study sought to identify those elements of place-based education, the Reggio Emilia approach, and experience design that could be applied to the educational setting to support continued growth of learners by enhancing their experiences, learning, and creativity. Some possible limits of the study include:

1. The study used a small and specific population (the Fine Arts Academy students in a suburban/urban high school), possibly limiting the generalizability of the findings to high school students in other areas.
2. The duration of the study was limited and attrition of the participants could have affected the study outcomes. The school community was in transition due to a generally depressed economy, with many students leaving and entering the school population during the semester.

Delimitations

Delimitations are as followings:

1. Students participating in the Television, Dance, and Visual Arts programs were from the High School Fine and Performing Arts Academy.
2. Two to five students participated in each of the three learning disciplines.
3. Participants were Academy members in their respective discipline.
4. Students were selected in consultation with the instructor of that discipline.

5. Instructors of the three disciplines did not change during the study.
6. Student/teacher disciplines interacted with the existing environments, insofar as possible.
7. One environmentally-specific experience was shared by the three groups.

Assumptions

Assumptions may be expected to have an effect on any study. The primary assumption was that all student participants were competent and committed to their chosen disciplines. The students were interested in both elevating their knowledge to a higher level of understanding and developing a deeper aesthetic sense.

Organization of the Study

The dissertation follows this organization:

Chapter 1 included the introduction to the study, statement of the problem, purpose of the study, research questions, significance of the study, definition of term, limitations of the study, delimitations, and assumptions.

Chapter 2 provides a review of the literature related to the problem: place-based Education, Reggio Emilia approach, and experience design. The literature review explored approaches to learning and living that were parallel to the Hebrew term, *Tikkun Olam*, expressing an individual's capacity to find and restore the wholeness of the world (Vital, 1978). *Tikkun Olam* suggested that individuals were responsible for improving the world that touched them and formed their environment. The Talmud expressed the view that people were not required to finish the task, but only to initiate it. This can be interpreted today as having each student find personal meaning through his or her study and making of art in which processes and outcomes were socially relevant and allowed for creative expression (Zimmerman, 2009).

The literature survey is comprised of four sections, including:

1. the use of *place* as a learning tool in developing an understanding and connection to the world around the individual,
2. a focus on how *experience*, relative to *place*, helps to develop a foundation for continued personal, social, cultural, and environmental growth and awareness,
3. the use of *non-traditional collaborations* in building on-going, life-long learning experiences, and
4. an analysis of the *over-all influence of a deeper understanding, appreciation, and partnership with one's environment* to the freedom of expressing personal creativity.

Chapter 3 presents the methodology, research design, setting for the study, identification of the population to be studied, sample selection, instrumentation, data collection procedures, and data analysis.

Chapter 4 illustrates and summarizes the results of analyses and findings from the study.

Chapter 5 provides a discussion of those findings relative to the scholarship framing the study, advice for educators from the findings, and recommendations for further studies.

CHAPTER 2

REVIEW OF RELATED LITERATURE

Overview of Literature Survey

Art Education, in this time of test-driven curriculums, is focused on standards and benchmarks developed and imposed by governmental departments of education, both state and national. The state of Michigan has identified five standards to address high school students' educational needs in the visual arts. They include:

1. ability to apply skill and knowledge to perform in the arts,
2. ability to apply skill and knowledge to create in the arts,
3. ability to analyze, describe and evaluate works of art,
4. ability to understand, analyze, and describe art in its historical, social, and cultural context, and
5. ability to recognize, analyze, and describe the connections between the arts and other disciplines; between the arts and everyday life (Michigan Department of Education [MDE], 1998).

Teaching approaches are not identified in the state standards and benchmarks document, providing teachers with a level of independence regarding how lessons are presented. Instructional materials are provided on the state web site to help teachers meet the standards requirements that can promote students' academic success. All materials are specifically aligned with grade levels.

Despite the emerging field of inquiry on placed-based education (Inwood, 2010), this topic has not been explored in materials provided by the government. Blandy and Hoffman (1993) defined placed-based education as a means "to teach students about art in a way that

promotes an understanding of the interdependence and interconnectedness of all things” (p. 28). This definition is aligned with the state of Michigan’s fifth standard to address high school students’ educational needs in the visual arts.

Three approaches to understanding one’s place in the world guide this study: placed-based education, Reggio Emilia, and experienced-based design. Placed-based education and Reggio Emilia focus on the education components. Placed-based education is situation specific and uses the world in learning, while Reggio Emilia provides a particular set of circumstances associated with placed-based learning. Experienced-based design’s focus is on people’s use of objects in a place. These three approaches suggest ways of understanding how experience, collaboration, place, and partnership with one’s environment can improve individual creativity and wholeness of the world.

Use of Place as a Learning Tool

Despite Dewey’s (1902) identification of the environment as a way to make learning effective, *place* often has been ignored as a tool to help people learn, connect, and express themselves. Instead place simply has been considered a “container” in which events happen, one not viewed as a player in the course of events, or as an influence on the quality and depth of one’s experiences. In addition, place rarely was used as the foundation for creative learning experiences. However, a few examples of place-based education exist to guide this research.

Approaches to Place-Based Education

As detailed below, three approaches exist for place-based education: (a) students use the environment as a tool to improve learning, (b) students learn about the environment and then act to protect the environment, and (c) students become politically active to change the environment.

These three approaches focus on *environment* as an important tool in the educational process, and are becoming increasingly social and political in nature.

The first approach asserts that the environment can be a tool to improve student learning. According to Smith (2002), through direct involvement with their immediate environment, students can become better problem-solvers and assume greater responsibility for their learning. Learning is increasingly driven by students, with greater learning resulting from increased interest and ownership. Here, students develop a greater voice in their education, and teachers find students become energized with a renewed sense of value in the local environment (Smith, 2002).

Place-based Education as an Environmental Learning Tool

Place-based education, as an environmental learning tool, focuses on opportunities offered by engaging the environment as an integral part of the educational process. Through this process, students and teachers have opportunities not found in most classroom settings (Smith, 2002). Such a practice disrupts the growing tendency to disconnect schools, communities, and families from the land on which they live and work, and contributes to a reduced sense of ownership of place (Smith, 2002).

In fact, the possibilities for developing an ethically-centered sense of care and responsibility seem less likely in a transient circumstance in which many families now find themselves. Such disassociation with one's immediate environment often occurs in both rural and urban environments (Smith, 2002). Modifying the curriculum to include characteristic properties of the community and region, while staying away from generic texts and lessons, provides numerous possibilities for students, teachers, and administrators, as well as the community to interact with their environment (Smith, 2002).

A significant increase has been noted in the percentage of students who are committed to their education as a result of the adoption of place-based education with the inclusion of instructional practices that are dependent on student initiative and responsibilities. This higher level of student engagement results in improved critical thinking and problem-solving skills, as well as enhanced interpersonal communication skills (Lieberman, 2000). In addition to the use of student-initiated instruction, place-based educational practices include interdisciplinary integration of subject matter, collaborative instruction, emphasis on real-world problem-based learning, learner-centered methods, and combinations of independent and cooperative learning (Chin, 2001).

Because children learn at different rates, regardless of the age group, all students are helped by having the flexibility of place-based educational practices. Sobel (1999) had been instrumental in developing the philosophy of place-based education. He designed a longitudinal study that incorporated place-based instructional practices for children from 4 to 7 years of age. Over a period of 10 years, using place-based educational practices, Sobel (1999) noted specific patterns in the relationship between children and their expanding environments.

Sobel (1999), working with teachers, developed a curriculum about birds to engage 4-to7-year-olds. They began by determining what children found appealing about *flying* and *nest building*. Using recycled pasteboard appliance boxes, Sobel and his colleagues fashioned individualized sets of wings for each child. With strapped on wings, children “flew” through forests, exploring life as if they were birds. The researchers used recently cut meadows as a source of materials, which children gathered to construct nests for themselves. Children observed birds and adapted what they had seen to paint their wings. Finally, children took notice of birds around them, making connections between their own wings, in particular bird colors and

patterns, using reference materials to learn about the kind of birds they were (Sobel, 1999). Through this study, the researchers concluded that children could become more engaged in their learning if participating in an out-of-school discovery process that led to a more school-like activity.

Ultimately, Sobel developed environmental curricula for different age divisions, 4 to 7-year, 8 to 11-year, and 12 to 15-year. From 4 to 7 years of age (early childhood), children stay close to their home boundaries (Sobel, 1999), with most play activities occurring within eyesight or earshot of home. Children speak of the animals they see in their yards, often expressing concern for, and a desire to protect, them. Eight to 11-year-olds (middle childhood) expand their home area to include their neighborhoods. These youth explore new areas and push their personal territory somewhat further. Twelve to 15-year-olds (early adolescence) continue to expand their area of exploration and begin to move out of their natural settings and into towns, malls, and other gathering places. This age group focuses on social aspects of the environment and friends become very important. As a result, they seek places where they can meet their friends.

Sobel (1999) suggested a guideline for an environmental education that would take the children from pre- and elementary school through middle school. Early childhood activities centered on the home-based environment and focused on developing children's empathy for the natural world in which they interact daily. Children in the middle years of childhood began to bond with their environment because of increased exploration. Early adolescents, being sociable by nature, began to discover themselves and their connection with society, with many inclined toward saving the environment. Their environmental curriculum might encompass community-

involvement projects, such as: school recycling programs, environmental clean-ups, and park beautification projects.

The use of place-based education, as a tool to help students succeed academically, has been evaluated in a number of ways. Information gathered from 40 programs in 13 states was presented at the State Environment and Education Roundtable in San Diego. The data from these programs provided evidence that place-based education improved performance on standardized tests, including reading, writing, mathematics, science, and social studies. The programs also were effective in developing higher-level critical thinking skills, reducing problems with discipline and classroom management, and increasing engagement in learning (Lieberman, 2000). Additionally, teachers were more enthusiastic about teaching, as were students in learning. Thus, place-based education incorporates multiple learning approaches, collaboration, problem solving, independent and cooperative tasks, student initiated learning, and interdisciplinary learning. The Reggio Emilia approach also gives prominence to place in children's learning.

The Reggio Emilia Approach

The Reggio Emilia Approach to early education emerged from Malaguzzi and parents in the Italian villages shortly after World War II. Parents thought that children developed their personas during preschool and primary education (Tarr, 2001). This educational program focused on “educators’ belief that children are resourceful, curious, competent, imaginative, and have a desire to interact with and communicate with others” (Rinaldi, 1998, p. 114). Using a self-guided curriculum, children learn respect and responsibility in an environment that supports and enriches their innate need to explore and discover (Reggio Children, 1996).

Malaguzzi , following his early visit to the United States, began to develop a philosophy for Reggio Emilia based partially on the writings on John Dewey (Tarr, 2001). Dewey (1902) believed that children learn “through, and in relation to, living.” Dewey’s education involved a process of living, rather than being merely for future living. Here, children received real materials, such as tools and cooking utensils, to use in their play. With this kind of reality-based play, children learned to live in a democratic society. Dewey also asserted that teachers should develop lessons based on children’s interests, and such lessons would provide traditional subject matter directly into children’s school experiences (Dewey, 1907). According to Tarr (2001), Malaguzzi found Dewey’s ideas compatible with his thoughts on education. As a result, he shared them with teachers of the Reggio Emilia Schools. Dewey’s principles soon became an integral part of the Reggio Emilia practices. Tarr (2001) further asserted that Dewey’s ideas and Reggio Emilia are similar through the relation between social life and real-life experiences inherent in the subject matter taught in the schools.

Environment as the Third Teacher

The physical space in a Reggio Emilia school supported the idea that schools were an extension of the environment in which they exist, and should reflect and engage it (Ceppi & Zini, 1998). The overriding theme of such schools involves integration of the classroom with the environment. Every classroom opens on a center piazza, reflecting the piazzas in village centers. Kitchens are open to view; classroom access and visibility to the community is achieved with ceiling-to-floor-size windows. Plants, courtyards, and doors provide access to the outside from every classroom. The entrance is open, and filled with light from wall-size windows.

Children’s art projects in these schools add a discussion that comes directly from children and is recorded by teachers (Gandini, 1998). Completed projects are displayed in the piazza at

both child and adult eye-level. Classrooms include examples of the children's work, along with photographs of projects in progress. Objects used to stimulate children's imaginations exist around the room, along with carpentry and cooking tools. Classrooms have ample storage areas that are arranged and rearranged to draw attention to aesthetic values. The primary intent of the school building and classroom design is to help children see things again, as if for the first time. Every classroom is divided into two areas: a collection of studio spaces, or atelier, intended for larger groups of children; and a smaller atelier for smaller groups.

The centrally located piazza provides communal space, allowing and encouraging children to interact with others (Gandini, 1998). Children use this common area filled with comfortable chairs and open spaces to move about freely and interact with other students. The accessibility of the piazza means students are not confined to the classroom, but are able to mingle with others, a common practice in Italian culture. The school's piazza also houses costumes, clothes, and props the children use in dramatic play that replicates different aspects of everyday life.

Reggio Emilia Curriculum

The Reggio Emilia curriculum has a number of components, including problem solving among peers, creative thinking, and creative exploration (Gandini, 1998). The use of these components varies, depending on children's needs and their projects. The classroom structure consists of a teacher who may be working with small groups on a project, while a larger group explores, with minimal teacher supervision, a variety of projects of their own choosing. As a result of the interactions and collaboration among students, teachers, and parents, open-ended projects often develop. Based on documentation regarding students' levels of interest, open-ended projects may or may not evolve into long-term projects. Among many considerations are

transitions from open-ended projects to long-term projects. These projects represent the academic interests of the children and the social values of the community. As long-term projects that draw the interest of children and teachers evolve, the incorporation of flexibility and improvisation proves valuable.

The fluidity and on-going nature of long-term projects provides strong motivation for children to become creative thinkers, as well as collaborators and problem solvers, aligning with Malaguzzi's unity between social life and the subject matter of schools. Many projects are community-based, such as the "Amusement Park for Birds" at the La Villetta School that includes waterwheels and fountains created especially for birds (Fraser & Gestwicki, 2000). This project evolved from children's interest in birds seen in the meadow near their school. Their interest resulted in studying birds, constructing birdhouses, and drawing the meadow from a bird's perspective. Following conversations with students, teachers found that children had an interest in building things from which birds could benefit. Based on the mutual interest of the children, teachers, and parents, a park was created on the school grounds to support birds in the area. Children built waterwheels, using spraying water and waterfalls, with some projects placed in calm water. All the waterwheels and fountains were designed and constructed to meet the needs of various birds in the area.

The cooperative nature of teacher-child relationships found in Reggio Emilia suggests children are involved in challenging work that includes discussions, decision making, planning, and coordinating projects, resolving conflicts, and more. Additionally, because of the cooperative involvement of both teacher and children with their common project, the teacher listens to children's suggestions and encourages them to exchange and respond to ideas. The

sharing nature of this approach seems to foster children's independence and responsibility, making teachers less likely to over-assist children (Rabitti, 1992).

Multiple Symbolic Languages

The Reggio Emilia approach encourages children to use graphic languages (Rinaldi, 1991) that include drawing, painting, clay and papier-mâché molding, and other construction media to record a day's events. These events encompass children's physical activities and their ideas, feelings, observations, memories, and predictions of projects. With the use of different media, young children are able to express their understanding of daily events more completely and easily than previously thought. Revisions of drawings and ideas promote greater collective understanding of the topic, especially if the children have followed group-driven modifications. Graphic languages are one of the symbolic languages used in Reggio Emilia, along with the written word. In their early years, children often begin to develop an interest in encoding and decoding the written word (Rinaldi, 1991). This interest is demonstrated by children's recognition of words and letters found in the environment, such as the M in McDonalds, or words associated with color and shape, such as a "STOP" sign. As children begin to make associations between the words and their meanings, they also begin to incorporate words, with invented spelling, into their drawings to explain the events depicted in the drawing.

In the Reggio Emilia approach, teachers and parents support children's writing by having children read to them. When asked, adults read back to the children. Writing is encouraged through the use of personal journals, which are written in "daily message" centers, where children may leave notes to other members of their class and in a newspaper center, where children are encouraged to interview other students, and take interview notes.

Children also develop a greater understanding of numbers through the Reggio Emilia approach. Children are confronted by numbers in many different ways (e.g., names, pictures, quantitative and measurement wording, etc.) without understanding the meaning of numbers and their purpose, values, and roles (Lewin-Benham, 2011). Such projects help children understand how numbers are used. For instance, at La Villetta School, numbered sheets of paper were taped to each step of the tall school building. Children numbered each step going up to the front door, and then numbered the steps going down from the front door. Children noticed that the number of steps was the same, but the numbers on steps going up differed from those going down (Fraser & Gestwicki, 2000).

Such practices engage children's interests, with teachers' observations and guidance allowing multiple language exploration. In the words of Malaguzzi (1984), the child has 100 languages and more:

a hundred hands, a hundred thoughts, a hundred ways of thinking, of playing, of speaking . . . of listening, of marveling . . . a hundred worlds to discover, a hundred worlds to invent, a hundred worlds to dream. (p. 3)

In fact, Malaguzzi (1984) thought that danger lies in any environment that fails to recognize the limitless potential of children:

They steal ninety-nine. The school and the culture separate the head from the body. They tell the child to think without hands . . . to understand without joy . . . that work and play, reality and fantasy, science and imagination, sky and earth, reason and dream are things that do not belong together. (p. 3)

Those inspired by Reggio Emilio must say, along with the child, "No way. The hundred is there" (Fraser & Getwicki, 2000, p. 268).

How Experiences Develop Personal, Social, Cultural, and Environmental Growth and Awareness

In second school of thought, students learn about the environment and then act to protect the environment. This group believes that place-based education is an educational tool, one that, in addition to increasing students' learning opportunities, also creates a more ecologically-literate and sensitive student. Such a student can become a more ecologically-conscious adult, resulting in a more ecologically-conscious society. This approach embraces both rural and urban students by using their environments and communities as educational resources. Students who are working within their own local context and scale are more inclined to become stewards of their environment once they identify and relate to real and proximate environmental problems (Chin, 2001). This school of thought anticipates that if educators want students to relate to the knowledge available to them in nature, they must be connected to the environment in which they live (Sobel, 1999).

An Ecologically-Literate Society

This second group pushes beyond place-based education as an educational tool. This group has an increased belief that place-based education can impact more than a curriculum. This approach is expected to (a) improve academic achievement, (b) revitalize teaching, (c) enhance social development, (d) and build stronger communities. Here over time, (e) students' environmental stewardship can improve and they can become (f) environmental activists (Wood, 1993).

Improve academic achievement. Education is forced to abstract concepts earlier than children are able to grasp them (Sobel, 1999). Wilber (1979) identified different kinds of knowledge as symbolic knowledge and intimate knowledge, with intimate knowledge being one gained through first-hand experiences. As a result, children lack the ability to connect signs and

symbols (symbolic knowledge) found on paper to the real world (intimate knowledge). Engaging children in objects in the real world then abstracting them can provide a stronger base from which to improve academic achievement (Gruenewald, 2003).

Revitalize teaching. Placed-based education is an emerging approach (Inwood, 2010) that builds a curriculum directed by the teachers. The innovative approach to art education balances the traditional roots of science education with the creative, affective, and sensory approaches of art education. Interdisciplinary nature of placed-based education input often is found from the history and math teachers, in addition to art and science teachers (Inwood, 2010). With this diversity of input, teachers become invigorated by the possibilities. Coupled with students' fresh ideas, varied experiences, and diverse interests; educational opportunities not found in other learning environments can be realized (McHugh, 2001).

Enhance social development. Because placed-based education is collaborative by nature, students develop communication skills, work effectively in groups, and develop useful interpersonal living skills (Chin, 2001). These skills are reinforced as students experience cooperation and team building with teachers from different disciplines, as well as community members. As these skills strengthen with time, students become more confident and willing to explore new working relationships with other students, teachers, and community members (Chin, 2001).

Build stronger communities. Schools in the past have been the centers of community life, however changes in the way schools are formulated and constructed has resulted in a disconnect from community life (Johnson, 2009). Inclusion of the community in education through community revitalization programs fosters new relationships between schools and communities. As the community-based programs expand and student learning occurs, communities are

welcomed in the schools resulting in stronger relationships (Johnson, 2009). When student learning takes place in communities, students learn practical skills as well as gain knowledge that their actions can make a difference in their environment (Wood, 1993).

Students' environmental stewardship. As students' increase their physical and emotional investments in the community and environment through neighborhood activities, a sense of ownership, empowerment, and a belief that they are able to solve local problems begins to emerge (Johnson, 2005). Problems in their immediate environment involve students personally, as they are impacted directly. Using place-based education and a hands-on approach, students learn that they can identify and solve problems. Using collective and independent problem-solving techniques, students begin to understand the many approaches that are available to solve the same problem.

Environmental activists. As students increase their involvement with the environment, a sense of ownership emerges (Chin, 2001). Students when engaging in their immediate environment begin to identify real problems that directly impact them and their communities (Blandy & Hoffman, 1993). Through place-based education, students develop skills to investigate, develop, and implement strategies to solve environmental issues in a responsible way. This direct relationship between students and their environment results in becoming environmental activists that then carries through their life courses (Fontaine, 2000).

Connections between education and environment can be enhanced by incorporating specifics of geography, ecology, sociology, and the politics of a place into local educational content. Five forms or types of approaches to education exist within place-based education (Smith, 2002):

1. *Cultural studies*: students conduct investigations of local history and cultural phenomena and identify themes important to the long-term viability of community.
2. *Nature studies*: students learn unique features of their place through environmental monitoring, restoration, gardening, often with emphasis on science and mathematics.
3. *Real-world problem solving*: students determine an issue they want to explore in greater depth, participate in developing a curriculum, and work with a community to solve the problem.
4. *Micro-enterprises*: older students link with economic opportunities in their neighborhoods through real enterprise partnerships, such as a recording studio.
5. *Community regeneration*: students learn to be citizens by being engaged in the community, investigating issues, and making recommendations to policy makers.

These approaches may be used individually, or in different combinations.

Implementing such place-based approaches can help students develop competence and commitment to their education. Learning is extended beyond the school building and into the real world, giving students opportunities to address problems that may impact future and long-term problems. Students identify and solve the problems in all five approaches. A teacher, or some other adult, acts as a guide, with students responsible for developing solutions to problems (Stone & Barlo, 2005). For instance, in Berkeley, California, Martin Luther King, Jr. Middle School students practice ecology principles as they reuse, recycle, and compost. Vegetable tops and scraps become stock for soup, a tin can becomes a cookie cutter, bottles are rolling pins, and kitchen scraps go to the garden compost heap. Meals are planned according to the seasons, and food that children plant in their gardens is included. Each activity increased their attachment to the natural world and strengthened their understanding of their place in it (Chin, 2001).

Communities benefit from place-based education when students and community members work together to improve the environment. Students realize that they can make a difference with community-based service projects. Students work to improve the quality of community life and add to the overall social capital of all members of the community (Chin, 2001).

Examples of students' contributions to their communities include:

- Green spaces have been created in the urban center of San Francisco.
- Schoolyards that once were covered in asphalt have been transformed into native-plant gardens across the United States with the help of residents, parents, and small businesses.
- With a renewed sense of empowerment, students in rural areas see places for themselves in their hometowns.
- Urban students begin to understand that they do not have to be alienated from their homes and communities; that they have a place in which to build a life (Eller, 2000).

By increasing community involvement, place-based education allows examining issues related to the dissociation of the community and schools, as well as the disconnect between young and old, their history of *place*, and the sense of *place*, itself. When community members, both young and old, understand their collective history, they become able to create a future that integrates all community members.

For instance, *The Wilderness Arts and Literacy Collaborative (WALC; n.d.)* exposes inner-city students to accessible wilderness areas through practicing environmental stewardship. Students and teachers study the impact of human actions, including consumerism, waste, and loss of habitat due to development, on the environment. Student-scholars write problem-solving

papers, based on field studies and interviews with the Miwok people (i.e. the Miwok lived in three detached groups, with the main body located on the long western slope of the Sierra Nevada Mountains between Fresno and the Cosumnes Rivers; Chin, 2001). These papers related Native Americans' connection to the land and environmental changes on their way of life. Through first-hand experiences with real places and people, these students began to understand the influences they have on the place in which they live and their desire to maintain the environment for future generations.

Experience Design

Experience design requires designers and users to question the need for “making stuff” for its own sake. As self-declared “problem solvers,” designers are interested in creating solutions to problems that may not exist. Such design systems have resulted in the creation of products/artifacts that were discarded once they were no longer useful (Peterson, 2009). Experience design drew from this ideal, a practice compatible with environmental stewardship.

Experience design continues to evolve over time. At least six dimensions are included in what constitutes an experience with regard to experience design: (a) time/duration, (b) breadth/consistency, (c) significance/meaning, (d) interactivity, (e) intensity, and (f) sensorial/cognitive triggers (Shedroff, 2001). Here, all aspects of experience adds to a person's understanding, with some of these experiences more notable than others. Certain experiences are worth sharing with others and certain elements of experiences are knowable and reproducible, thus designable (Chochinov, 2001). The Designers Accord, a coalition of designers, educators, and business people, emerged committed to working collaboratively to create a positive social and environmental impact on sustainable design practices. The general principles of experience design include (a) informing and educating others on sustainability, (b) sharing of best practices

with others through a community website, and (c) working collectively, coalesce to create positive environmental and social experiences (Chochinov, 2009). Thus, experience design suggests a design approach in both technology (digital and on-line communication and information-sharing), and real-world design applications matched to environmental stewardship.

Nontraditional Collaborations Building Life-Long Learning Experiences

Critical pedagogy of place, the third school of thought in place-based education is the most socially- and politically-conscious. Critical pedagogy of place (Gruenewald, 2003) blends critical theory, the critical pedagogy of Freire (1998) and Giroux (1988), and the place-based educational beliefs held by Orr (1992) and Sobel (1999). On the one hand, creating an understanding between the student-citizen and the place they inhabit came from place-based education, while understanding both social and ecological responsibilities these student-citizens have to a particular place, one that challenges assumptions, practices, and outcomes often assumed in place-based education comes from critical pedagogy (Gruenewald, 2003).

The blending requires modification of the both theories – place-based education and critical pedagogy. Place-based educational approaches may be reluctant to link ecological themes with critical themes, such as urbanization and homogenization of culture under global capitalism (e.g., Harvey, 1996). Critical pedagogy, conversely, often fails to consider that human culture has been, is, and always will be nested in ecological systems (Bowers, 1997, 2001).

Such a blending requires overcoming historical practices. Historically, critical pedagogy has focused on urban areas, while place-based education tends to be rural and focused on the environment. The potential to highlight the importance of situated context and the goal of social transformation might be achieved by overlapping the two approaches, because places are social constructs, filled with ideologies and peoples' experiences of those places. Black inner-cities and

White suburbs socialized identities (Gruenewald, 2003). Ultimately, the challenge remains to integrate these critical multi-cultural urban themes, which requires an examination of the interaction between cultures and ecosystems.

Bowers (2001) believed that an interconnection exists between cultural and ecological life. He advocated eco-justice as a critical framework for educational theory and practice, and suggested four primary foci:

1. Understanding relationships between ecology and cultural systems; specifically, between the domain of nature and the domain of oppressed groups,
2. Addressing environmental racism, including the geographical dimension of social injustice and environmental pollution,
3. Revitalizing the nonaccommodated traditions of different racial and ethnic groups and communities, especially traditions that support ecological sustainability, and
4. Reconceiving and adapting lifestyles in ways that do not jeopardize the environment for future generations.

Bowers (2001) viewed educators' responsibilities to include being responsive to all aspects of the human condition. This goal of educators should be to help develop an ethic of social and ecological justice, with issues of race/ethnicity, class, gender, language, politics, and economics addressed in terms of people's relationships to their total environment.

Critical pedagogy of place generates interest in examining the relationship between environment, culture, and education (Gruenewald, 2003). Teachers and students need to expand their understanding of these entities to include social and ecological concerns of the places they and others occupy. Developing a critical pedagogy of place requires all involved people to be willing to look inwardly at their communities and lives. They must then question those principles

that need to be preserved continually, and determine what cultural, political, economic, and ecological changes need to be made to improve education.

Both critical pedagogy and place-based education aim to empower people to act on their own behalf (Gruenewald, 2003). Place-based education empowers through empathy, discovery, and connection to the environment. Critical pedagogy focuses on empowering oppressed people to change their conditions. Gruenewald (2003) further asserted that bringing them together created a balance between transforming oppressive conditions and developing an empathic connection to others and place.

Based on Freire's definition of situationality, Gruenewald (2003) argued that place-based education focused on local ecological and social action, while critical pedagogy's belief was geographically specific. "Reflection upon situationality is reflection about the very condition of existence: critical thinking by means which people discover each other to be 'in a situation'" (Gruenewald, 2003, p. 4). The connection between geography and experience with ecology and social concerns allows individuals to develop understandings of their place that encompass all of these components.

Critical pedagogy of place establishes a link between the classroom and cultural politics (Gruenewald, 2003) and provides a coherent theoretical framework that is lacking in place-based education. Classrooms can be problematic because their scope limits the range of ideas and issues that can be considered. As a result, students and teachers may be well advised to go outside of the school environment and experience the world beyond the school walls. This movement could include environment in all its forms, from urban to rural, encompassing the shared cultural, political, social, and historical milieus.

The critical pedagogy suggested two approaches to link school and place-based education to cultural and ecological politics: reinhabitation and decolonization (Gruenewald, 2003). The goal of a critical pedagogy of place thus becomes (a) reinhabitation, a way to identify, recover, and create places that teach people how to live well in the whole environment; and (b) decolonization strategies to identify and change the way people think and are taught about colonization, especially the exploitations of other people and places.

Berg and Dasmann (1990) defined reinhabitation as “learning to live-in-place in an area that has been disrupted and injured through past exploitation” (p. 35). Orr (1992) explained it as, “The study of place has much significance in re-educating people in the art of living well where they are” (p.130). The meaning of living well often differs according to geography and culture. A politicized, multicultural, critical place-based education may explore how humanity’s diverse cultures attempt to live well in the age of globalization, and what cultural patterns should be conserved or transformed to promote more ecologically-sustainable communities (Bowers, 2001). Regardless of where one lives, reinhabitation requires knowledge of place that includes identifying and conserving all forms of cultural knowledge that nurture and protect people and ecosystems.

Decolonization involves learning to recognize disruption and injury in an environment and addressing their causes. From an educational perspective, decolonization means unlearning much of what the dominant culture and school has taught, and then learning a more socially-just and ecologically-sustainable way of being in the world (Gruenewald, 2003). Bowers (2001) wrote that decolonization is more than an act of resistance, limited to rejecting and changing the dominant ideas of the time. Decolonization must recapture traditional and nonaccommodated cultural practices, such as mentoring and intergenerational interactions. Choices need to be made

regarding which aspects of community life contribute to the well-being of all people and the places they inhabit. Concerns against injustice must be balanced with renewed relationships of care for people and the environment (Bowers, 2001). Shared experiences can result in personal reflection and dialogue with others to identify what contributes to community well-being. The results of these discussions promote a collective understanding of what needs to remain as a critical part of the community culture.

Community and Parental Involvement

Another example of nontraditional collaboration can be found in the roots of Reggio Emilia educational practices. Italy has a history of community support for families with young children, with Reggio Emilia embracing that ideal by involving the community in educating its youngest citizens. These schools have become a vital part of the communities they serve, as is demonstrated by the substantial level of financial support provided by the community in which the schools are located (Rinaldi, 1998). An advisory board, comprised of members from the community in place called *La Consulta*, has major influence on the policies of local government.

Parents' roles in these communities are connected more directly to the daily activities of the school. Parents are expected to involve themselves in discussions on school policy, child developmental issues, curriculum planning, and student evaluation. To ensure that most parents are able to participate in these meetings, they are held in the evening (Malaguzzi, 1997).

Teachers as Learners

The Reggio Emilia model of education requires teachers to view themselves as on-going learners interested in understanding the children with whom they work (Malaguzzi, 1997). The basic philosophy asserts that education is continually evolving and changing to meet the needs of the children and their continued growth. Teachers have autonomy to develop educational goals

that establish the foundation for staff development opportunities. Teachers develop guides, curricula, and achievement tests as needed, without external mandates and impositions. Because of the self-directed nature of the Reggio Emilia approach, teachers must be keen observers of classroom activities that can allow them to develop educational tools needed for the continued growth of their students, as well as themselves.

The tasks of teaching, observing, and documenting are divided routinely between two in-class teachers. This process permits both teachers to become adept in all aspects of the approach, as well as allowing ‘teaching approaches’ with more than one point of view (Malaguzzi, 1997). Recorded observations are shared among all the teachers, as well as with the “*atelieristi*” and parents. They are used to help formulate curricula, evaluate what is working, and determine where improvements can be made. Teachers at several schools often work with the “*atelieristi*” to explore ways to expand children’s existing spontaneous activities.

The Reggio Emilia model incorporates schools as an extension of the child’s family, home, and community. The physical space is warm and inviting, and the children are with the same teachers for three years. This practice establishes intimate relationships among the family, teachers, and children. Project work most often is completed in small groups, allowing teachers to interact closely with children (Malaguzzi, 1997). There is no whole-class formal instruction, resulting in the creation of the same picture or product. The individual, intimate, and familiar nature of instruction helps children understand that their work and ideas are taken seriously, and that adults with whom they interact value them as active participants in their education (Malaguzzi, 1997).

Extensions of Families and Communities

Reggio Emilia's schools thus reflect the values of the community and families in which it operates (Malaguzzi, 1997). The physical buildings are an extension of the homes from which the children come. The school is filled with plants, comfortable furniture, and pictures. The floor plan is open, with a piazza onto which all classrooms open. It is similar to those found in city centers. Children have chores that are directly related to daily life; they may help with cooking, set or clean dishes from tables after meals, or organize art materials (Malaguzzi, 1997). These shared responsibilities give students the informal feel of an extended family. The family/community collaborative model helps young learners achieve a sense of personal responsibility. Teachers and students remain together for three years, so families and teachers form strong bonds, making them more like family members than merely teachers and students.

The inclusion of the environment in the learning process, the involvement of parents and community in a meaningful way in their children's education, the value placed on the work and ideas of children, and the teachers being learners along with the children are examples of nontraditional collaborative relationships. Risk-taking is celebrated, rather than feared, and children have opportunities to realize their talents in the real world.

The Influence of a Deeper Understanding, Appreciation, and Partnership with Environment

“When something is ‘designed’ it suggests that there is some thoughtful exploration occurring. Assuming design is about linking the imagination to its material form, when design is attached to something” (Bleecker, 2009, p. 4). Experience design is transformative both for the user and the designer. Every designer brings his/her experiences to the product, and every user, through his/her interaction with the product, becomes a designer. Experience design is fluid, encouraging everyone who is engaged with the product, on any level, to participate in

influencing its evolution, a process requiring time, and a key element of the design process. Users and designers must have time to interact with the product to develop an understanding and ultimately reduce its complexity. An improvement in the quality of living results from such an evolution (Buxton, 2009). With experience design, the user's needs and experiences are paramount to the design, eclipsing the function and usefulness of the product. No longer do the manufacturer and designer impose what they believe are needed on a user. Through the inclusion of psychology, anthropology, architecture, environmental design, industrial design, cognitive science, ethnography, story-telling, and ergonomics, this multiple-disciplined approach helps designers create a connection among themselves, the user, and the product (Buxton, 2009).

The themes of simplicity of design and multiple uses appear repeatedly in products. Products and/or artifacts must be explored from design perspectives, with multi-functional uses of products developing over time. After this exploration, a qualitative and open design process can be expected (Brandes, 2009). Rather than thinking about design concepts that result in specific need products, designers should explore concepts that result in extending product life. Users and designers must have time to interact with the product to reduce product complexity and expand its use. An improvement in the quality of living results from this evolution (Buxton, 2009). In fact, Chochinov asserted that when the teaching of design includes the belief that the user is an object of commerce, the end effect is elimination of the relation between the product/artifact and the user, a concept contrary to the fundamental principles of experience design (Heller, 2009).

The present study involves South High students designing artwork for the native species garden at the high school established by the science department. To create artwork, the students move beyond the classroom to research the plants and insects attracted to the plants. They

needed to research possible projects that would be suitable to a northern environment. This investigation included research on information regarding materials needed, appropriate projects, and relevance of the artwork to the environment. Once their research was completed, artwork that met the expectations of the user and the environment was created by the students.

Fukasawa and Morrison (2007) coined the phrase “super normal,” to designate a design that acts as an umbrella for designs that value the unassuming look of an object that extends beyond the visual, while possessing a quality of materials, simple design, and exacting details. This type of design provides opportunities to develop experiences with the product/artifact that is based on its intended use. Super normal design is about a nonextraordinary or nonnoteworthy object performing in a sensational way. Fukasawa and Morrison (2007) became aware that commercially successful objects had an equal balance of esthetic and functional design, together with additional advantages of using appropriate materials in their development. Consideration was made of the human experience of living with, and use of, the object, in addition to how the object affected its environment and communicated its purpose. Less noticeable objects, over time, became objects of daily choice because of their efficiency and charm (Fukasawa & Morrison, 2007).

Fukasawa and Morrison (2007) believed design that contributes to the man-made environment is polluting the natural environment, suggesting that the historic goal of designing objects that make life easier and better has been side-tracked. Morrison asserted that through glossy life-style magazines and marketing campaigns, designers are competing to make things noticeable, using color, shape, and even surprises. Morrison believed there are better ways to design, rather than putting time and effort into making a product look special. Special products demand attention for the wrong reasons, potentially becoming useless, with their demanding

presence (Fukasawa & Morrison, 2006). The design approaches of Fukasawa and Morrison (2006) typify experience design by maintaining a balance between four basic principles:

1. Design determines if a need exists for a new product/artifact;
2. Design establishes the sustainability of the product/artifact;
3. Design includes the user in the on-going design process; and
4. Design affects the users' daily interactions with the product and builds unique experiences.

The balance of these four principles helps assure that the experience between user and product/artifact remains the focus, rather than merely creating “stuff” for consumers.

The same may be said of Muji, a Japanese housewares brand manufacturer, that also embraces many principles of super normal (Currey, 2009). Roughly translated, Muji means “no brand.” This global brand started in the 1980s as the “in-house” brand for a supermarket chain with a focus on affordably-priced packages of irregular foods, such as dried broken shiitake mushrooms. The product design, at first glance, appears to be simple. Through a sophisticated approach and thought process, a group of products has been created that are unobtrusive, yet occupy people's daily lives and provide reliable doses of small pleasure (Hara, 2007).

Summary

The reviewed literature explored specific elements within the three approaches of place-based education, Reggio Emilia, and experience design. These approaches support the overarching concepts of using place as a learning tool for developing an understanding and connection to the world around the individual; a focus on how experience, relative to place, helps to develop a foundation for continued personal, social, cultural, and environmental growth and awareness; the use of nontraditional collaborations in building on-going, life-long learning

experiences; and an analysis of the over-all influence of a deeper understanding, appreciation, and partnership with one's environment to the freedom of expressing personal creativity.

Ultimately, place-based education and Reggio Emilia's focus on education provide structure for helping students understand how place enhances experiences, creates opportunities for collaboration, and develops a sense of partnership with the environment. From these partnerships, students develop an understanding of what can improve individual creativity and an increased sense of place.

Placed-based education appears to hold opportunities for high school aged students. Despite a significant base of information gathered from younger students (Sobel, 1999) no research was found on the potential impact of place-based education on high school age students. A similar gap exists for Reggio Emilia's that focuses almost exclusively on pre- and primary-school students (Tarr, 2001). Clearly, learning tools of place, student-centered learning, collaboration, and problem solving are not constrained to those under the age of 7 years, raising interesting issues about how foundational learning techniques developed in young students might be supported instructionally in middle and high school. Finally, high school students failed to garner the attention of experienced-based design practitioners.

While experience design focused on objects' usefulness in a particular place and on support of users' needs in that place, designers studied 35 to 55 year-old people (Buxton, 2009). Thus, in spite of high school students' considerable buying power, input from them has not been included in studies about the usefulness of objects. Thus, the extending premise of this study includes place-based education, Reggio Emilia, and experienced design to encompass high school students. It seems reasonable to expect such practices have the potential to offer high school students' opportunities to develop understandings about the myriad ways that experience,

collaboration, place, and partnership with one's environment might improve creativity and connectedness with their world.

I began to wonder about the nature of experiences had by high school students enrolled in a multicultural high school arts program. Specifically:

1. What is the nature of the creative learning experience?
2. To what extent might these experiences incorporate the environment and encourage creativity?
3. To what extent might such experiences offer opportunities for collaboration of students in developing the curriculum? and
4. To what extent might such experiences support students to develop partnerships with the environment and allow alternative uses for a product?

The methods that were used to collect and analyze data to address the research questions are presented in Chapter 3.

CHAPTER 3

METHOD

Introduction

Artists often need nurturing and support to help them grow creatively. The sources of creative growth are as varied as the artists themselves. Warhol (1977) is quoted as saying, “Being good in business is the most fascinating kind of art. Making money is art and working is art and good business is the best art” (p. 87). When asked about his creative sources, Warhol told of asking about 10 or 15 people for creative suggestions. One lady friend turned the question back on him, asking, ‘Well, what do you love most?’ [he responded] “That’s how I started painting money” (p. 125). For Warhol, business and money were always primary sources of his creativity.

Other artists found experiences and the environments impacted them personally, affected the world around them, or provided inspiration for creativity. While he worked, Jean Michael Basquet (n.d.) did not think about the painting, but thought rather about life. Andy Goldsworthy’s (2004) work interacted directly with the environment. His installation works are constructed in the environment with the understanding that the environment may ultimately destroy them.

My art is an attempt to reach beyond the surface appearance. I want to see growth in wood, time in stone, nature in a city, and I do not mean its parks but a deeper understanding that a city is nature too-the ground upon which it is built, the stone with which it is made. (Goldsworthy, n.d.,p. 1, para. 18).

The work is photographed for documentation. The photographs allow the artist to view the artwork at a distance and help him/her visualize what he/she has created more clearly (Goldsworthy, n.d.).

Many artists return to nature for creative stimulus. van Gogh (Lord, 2003) said, “I devour nature ceaselessly. I exaggerate, sometimes I make changes in the subject, but still I don’t invent the whole picture. On the contrary, I find it already there. It’s a question of picking out what one wants from nature” (p. 90). Hume (2010) quoted Cezanne who used the beauty of nature as the standard by which he judged his own work, stating: “When I judge art, I take my painting and put it next to a God-made object like a tree or a flower. If it clashes, it is not art” (p. 177).

Thus, creativity can be impacted by the environment in which an artist works. Creativity may be part of an economically, socially, or naturally-centered environment, with each having the potential to play a part in the creative process.

Place-based education, Reggio Emilia, and experience design provide ways to examine the impact of an artscape. This project focuses students’ artistic expression through interactions with the natural environment via the physical design of the artscape, and uses products/artifacts that enhance the artscape. Here, an ethnographic methodology provides a holistic way to understand artist, artscape, and wider environment as a cohesive whole.

Ethnographic Method

Ethnography is one of five qualitative approaches (e.g., narrative, phenomenological, grounded theory, ethnographic, and case study) to inquiry. Ethnography’s focus is on an entire cultural group, seeking to describe and interpret the shared and learned patterns of values, behaviors, beliefs, and language (Creswell, 2007).

Ethnography is a qualitative research method (Denzin & Lincoln, 1998) that allows for an exploration into a social situation to gain an understanding of the impact of environment, such as during art education activities to enhance creativity. In particular, ethnography engages people as they act in and experience the world (Spradley, 1980). Additionally, ethnographic researchers

strive to *learn* from people, rather than simply *studying* people (Spradley, 1980). Ethnography unites fieldwork, people's sense of their work and actions, and artifacts (things used and produced in a particular setting), which makes it particularly useful in an art class. Ethnographic fieldwork involves participant observation and ethnographic interviews, whereby the ethnographer comes to know the culture. At the same time, the collection of artifacts provides a way to understand how a culture is portrayed, or made real, by people in a particular setting.

Little research exists regarding the creative education of high school students, primarily because youth's specific needs are difficult to explore through some research methods such as in a survey research using statistical methods. Thus, ethnography suits the need to discover how environmental conditions support creativity in students.

Ethnographic researchers recognize that what is understood or known to be true for a group of people is constructed over time and remains in continuous flux. As such, social life (i.e., an art education activity) is produced through ongoing social interactions among group members (LeCompte & Schensul, 1999). Meaningful relationships in the group become established through partnerships between the participant researcher and the participants. Often, the distinction between a fully-participating researcher and the research participants blurs, as participants' involvement in the research process influences the direction of subsequent research activities (LeCompte & Schensul, 1999). A consensus among participants, resulting from interactions that build a deep sense of understanding of a situation with common elements, are intended to provide direction and action in the future (Nastasi & DeZolt, 1994).

The role of the researcher in ethnographic research balances participation and observation, and as an active participant in activities establishes a negotiated meaning between and among participants. The researcher also must strive to assure that all participants are equal

partners in the process of creating and understanding the data collected (LeCompte & Schensul, 1999). Here, a researcher has the responsibility of processing information, responding with sensitivity to social cues and artifacts, and modifying the research design as data are interpreted and new questions present themselves. The researcher seeks to build theory (or explanation) based on observations of events as they develop daily. Rather than testing a theory against data, the theory grows from the data collected by the researcher in the specific context of the study. With the theory developing from the researcher's observations, subjectivity proves important to a successful study, with bias minimized through systematic attention to seeing the world from participants' vantage points, and not from that of the researcher.

Research Setting and Participants

The study included the participation of individual students in the Visual Arts Academy of an ethnically and racially diverse High School, a school situated in a community that has both urban and suburban qualities. The 1,200 students at the High School included African American (95%), African (3%), Caucasian (2.5%), and Asian (0.5%) communities. The Visual Arts program was located in a separate wing from the academic core classrooms of the school. The arts wing houses all students involved in the fine and performing arts (e.g., dancers, musicians, actors, television/film creators, and visual artists) at the High School. The performing arts students refer to themselves as "G-wingers," referring to their locale in the school. While not a school-in-a-school, the Fine and Performing Arts Academy provides additional support to students dedicated to pursuing the arts beyond high school. The Arts Academy involves high school students committed to the visual arts as a method of personal communication. Many of these students already had met with some measure of artistic success. Additionally, they were looking to improve their talents by seeking new experiences and challenges. Their interest was in

creative personal growth, one of several reasons these students choose to become members of the Academy. These students are somewhat more advanced artists than other non-Academy art students, thus the study focused on the impact of the environment on Academy students' current skill level, as opposed to developing foundational art skills.

Written permission for limited-entry status has been obtained from the principal. Schools are considered "limited-entry social situations" requiring permission for research (Spradley, 1980). All student participants were volunteers, have parents' permission to participate in the research, were informed of the nature of the research, had all concerns addressed satisfactorily, and signed an assent form to participate in the research.

Art Activity

Since the beginning of the seventh week of school, the AP Studio students had been required to maintain a research workbook based on requirements of the International Baccalaureate (IB) Fine Arts Program (International Baccalaureate Organization [IBO], 2007). These workbooks were students' personal investigations into sketching, material, technique, and mediums, in addition to exploring, experimenting, and developing ideas for art projects. With the notebooks they were able to interpret themes and connect ideas from which they were developed. History, anthropology, culture, nature, and even trends were to be explored and included in the workbooks. The workbook connects visual, as well as written research and a reflective rationale that is used to describe, analyze, and reflect their art projects. Students were expected to make two entries into their workbook every week, with each entry describing the rationale for current and future projects.

The students begin their research on the environment from outside the classroom in the spring. A component of the research workbook included outside observations as part of their

discovery process. The students were free to choose what they observed and present in their workbooks, such as building, parking lot, school grounds, plants, animals, gardens, and trees. As with all workbook entries, the class members discussed/critiqued the entries on a weekly basis. These discussions/critiques include the depth, strength, areas of concern, and thoughts on the future direction of their art projects.

As part of the required workbook environmental research, the students determined the extent to which they become involved in environmental studies and/or environmental projects.

The arts activity was a partnership with the science department's newly planted pollinator garden. The students who choose to participate created art projects that can be used in the garden at the school. The type of art projects was left to the students, and can include, but was not limited to: paintings, sculpture, and installation pieces.

The partnering science teacher introduced the project by presenting a PowerPoint™ presentation on native plants and why they are desirable to the visual art students. This presentation included images of mature plants and insects native to the garden as reference. The students began to plan their art activities and record their thoughts in their workbooks. The students were encouraged to be creative, but also told that the art projects would be placed outside in the garden, so some mediums may not be appropriate. Reference images, photographs, thumbnail sketches were included in the workbook and were part of the weekly class discussions.

The students were informed that the art project must be completed within the six-week time frame. Their finished projects were assessed on aesthetic value as well as the research that they conducted prior to and during their work on the art project.

The Academy is a public school, and I am one of its teachers. As the visual art teacher for the Academy for the last 16 years, I have long-standing, established relationships with students. They, as well as their siblings, have taken a number of my classes. Additionally, many students are involved in the extracurricular activities I sponsor (e.g., art club, set construction crew for the yearly plays and musicals). The planned art activity for the study is consistent with the curriculum and presents minimal intrusion in their coursework.

Participants

Students recruited for the study expressed an interest in the visual arts by checking the appropriate box on their registration form. In addition, the decision to include them in the academy class was approved by parents and influenced by schedule demands and guidance counselors. These students represent the student body, although primarily interested in the performing and visual arts, living in an urban environment, and previously having a minimal exposure to the natural environment (Bouma & Atkinson, 1995).

Students selected for inclusion in the study had demonstrated a long-term involvement in the visual arts and are members of a group of dedicated students who comprise the visual art component of the Academy. Their involvement in the visual arts discipline of the academy program furthers their artistic growth. Students' artist productions – drawings, paintings, and sculptures created in different environments – were important for understanding the impact of environment on creativity.

Eight students from High School Visual Art Academy were asked to participate in the research activities. Students range in age from 15 to 18 years, with a balance between boys and girls. These students have been at this high school for at least three years with the exception of one freshman student, and are currently engaged in visual arts. None of the students seems to

consider the environment a source of creative growth; on the contrary, these students live, work, and create in urban communities, where being outdoors proves uncommon. While study participants possessed characteristics relevant to the study, they were representative of high school students living in urban communities, in that they were visually creative, but lacked exposure to the outdoor environment for creative growth (Schensul & LaCompte, 1999).

I sent letters and an information sheet to parents of Academy students via first-class mail, asking them to return the bottom portion to school, phone, or email me if they do *not* wish their student to participate in the research. Then, the dissertation chair sought written assent from those students whose parents did not opt them out of the study, and the chair retained the signed original copies of the assents until grades for the art unit being studied are submitted. (Most data collected from participants came from routine learning activities.)

All students in the Fine and Performing Arts Academy group were involved in participant observations, environment observations, non-directive interviews, and the creation and documentation of artifacts. As described more fully below, and in keeping with routine teaching practices, the teacher took notes related to students' in-class activities, students' art progress, and teacher-student exchanges. Students' also kept journals about their experiences in art activities. Digital cameras also were distributed to allow students to record influential objects and events, as well as documenting aspects of their work. Throughout, ID codes or pseudonyms were used in the teacher's notes. During this time, a list linking pseudonyms to first names was kept in a locked file drawer at the teacher's home office. Keeping teacher notes using ID codes or pseudonyms reduces the potential for loss of confidentiality should teacher notes be seen by others and reduces the likelihood of identifying information being included in the research records.

After the end of the semester in which routine teaching information about students is collected, the chair then informed the researcher which students assented. The researcher used portions from the *student* information (the teaching notes and informal conversations during teaching, as well as art projects/artifacts, or still images of these) that relate solely to participants. This portion of the student information was removed from the school and become a de-identified data set for research analysis that was stored in the researcher's home office. Non-participant names and pseudonyms were removed from the list that linked the students' names to their pseudonyms. The shorter list of participants was shredded after the final dissertation is approved.

Data Collection Methods

Multiple data collection sources were used to assure redundancy of information or triangulation of findings (Denzin, 1978): participant-observation field notes and reflective commentary, informal interviews, group discussions about the art activity (termed "group critique"), artifact collection, and semi-structured interviews (following submission of grades and limited to participants). The ethnographic methods approach in this study revolved around participant observation of activities, a strategy that the teacher-researcher routinely uses during art-education activities. As an already embedded member of this population, my participation was both expected and required. Insiders' understandings of events recorded in the field notes and reflective commentary was sought through informal conversations during art activities. In addition, artifacts were collected.

Participant artifacts—student journals, student digital photographs of specific visual stimuli, visual products, and completed visual products themselves—were an integral part of the data collected. To the extent possible, identifying information was removed from the artifacts. That is, names on student journals were covered when copied for inclusion in the data set,

signatures on digital images of artwork were obscured, as well as facial features of people included in digital images. However, signatures on artwork itself were not changed, so analyses of these were completed in the school art studio, during times when others are not present.

The generation of artifacts began with the researcher engaging student artists in thinking about how the environment has had an impact on creativity (i.e., providing them with written historic, as well as recent-personal testimonies on the subject, and having them record their thoughts in a journal). Student work was collected and photographed, and students took digital photographs of their progress and objects or events that influenced their creativity.

Group critiques occurred before and after interaction with the natural environment to gauge to what extent students' sense of the interaction between the outdoor environment and creativity changed after the activity. Critiques were open opportunities for students and teachers to explore the success and opportunities for growth in the current body of student work. Discussions center on how students' cultural backgrounds and life experiences may have impacted the work, and on how current and historical social influences, as well as unexpected discoveries, impacted the process. Critiques also were opportunities to discuss composition, technique, craftsmanship, and medium in a nonjudgmental environment. These critiques were an exploration into both personal and technical growth.

Semi-structured interviews followed submission of grades and help deepen preliminary findings gleaned from a first-pass analysis of participant data (field notes, informal conversations during class, group critiques, and artifacts). Once identifiable domains present themselves, interviewing took place to explore the identified domains, as well as to perform member checks. Thus, these interviews focused on students' experiences during the art activity, especially journal entries and art productions, as well as on how the photographs they took represent influences on

creativity. I attempted to break down elements of defined domains into basic factors and sub-factors (LeCompte & Schensul, 1999). These interviews lasted from 45 to 60 minutes, and were held in a private location (such as my office after school or a public library study carrel), were tape recorded, and transcribed word-for-word to ensure accuracy in capturing participants' responses. Audio tapes were destroyed between checking transcriptions and dissertation defense.

Students' participation in the study lasted for seven weeks. Thirty data-collection sessions (class meetings) were used with each session lasting approximately one hour. The semi-structured interviews were held during week 7, with data analysis completed during the 8th week. Table 1 presents the timetable that was used to collect the data and complete the data analysis.

Table 1

Timing of Research Activities

Week	Obs'n	Informal Intrv	Stdnt Jrnl	Artifacts	Grp Crit	Intrvw	Data Mgmnt	Analysis
1			X		X		X	
2	X	X	X	X			X	
3	X	X	X	X	X		X	
4	X	X	X	X			X	
5	X	X	X	X	X		X	X
6	X	X	X	X		SUBMIT GRADES	X	X
7							X	X
8						X	X	X
9						X	X	X
10						X	X	X
11							X	X
12							X	X

Data Analysis

Ethnographers use a cyclical process that interweaves data collection with analysis and writing. In this particular study, because of not knowing which students are participants, very preliminary analysis guided the researchers activities in the field, but analysis proper began only after grades were submitted for the art activity. Multiple levels of ongoing analysis exist in ethnographic research. As patterns present themselves, researchers continue to assess what stories were emerging and where they would lead them (LeCompte & Schensul, 1999), and then follow those stories or aspects of the situation that relate most closely to the research questions identified in Chapter 1. Transcribed field notes and reflective commentary were reviewed periodically to identify cultural domains embedded in them, as part of semantic domain analysis that follows patterns of sameness in the information. After submitting grades and removing any

information about students who did not assent to participate in the study, a thorough semantic data analysis was performed. Included terms (phrases, ideas, actions, etc.) were identified that relate in the same way to a cover term (or domain name). This triad of included terms, relationship, and cover term comprises each domain. Domains that persist in multiple kinds of data and at different points in time in the same kind of data deserve retention in findings, and demonstrate triangulated results. These domains suggest a comprehensive list of domains that describe the setting studied.

Once a list of domains is created, an understanding of the cultural scene begins to emerge, allowing the researcher to move the study forward with an increased sense of the culture (Spradley, 1980). Following the construction of cultural domains, a taxonomic analysis provides information about the relationships between sets of included terms within a domain (sub-domains) and relationships between and among domains. I used Spradley's (1980) line and nodes organizational technique (p.120) to facilitate visualization of relationships among domains. Semi-structured interviews occurred once a tentative taxonomy is constructed, to fill gaps in information and deepen understanding, as well as allow insiders to corroborate (or member check) findings. These interviews were analyzed to help tighten findings.

A componential analysis was performed with all data. A componential analysis seeks contrasts found in the cultural domains. I used Spradley's (1980) paradigm chart (p. 132) for central domains only, looking especially for instances when there is variation in the ways that different participants understood the art activity. The use of Spradley's chart helps the researcher seek nuanced variations systematically across participants and compare findings from different points in time, or in different spaces.

Trustworthiness

As a qualitative study, trustworthiness provides criteria for research quality analogous to internal validity, external validity, reliability, and generalizability of findings. Lincoln and Guba (1985) developed four criteria: credibility, transferability, dependability, and confirmability.

Investigational *credibility* assures that findings are consistent with reality, with minimal bias on the part of the researcher (Merriam, 1998). Establishment of credibility is critical to the trustworthiness of a qualitative study (Lincoln & Guba, 1985). A number of approaches ensure credibility. *Prolonged engagement* helps the researcher be seen as a normal part of the field site, and prevents having undue influence on the site. *Persistent observation* allows the researcher to observe important aspects of the situation being studied. Both of these criteria are met by this researcher who is a long-term teacher in the site, hence her presence is not unusual. Using the art project to focus students' gaze outdoors sets the bounds on the social space being studied. *Triangulation*, for different kinds of data (methods; Yin, 2009) and for different participants (sources) is built into the data collection processes. *Peer review* occurs with committee members who provide a sounding board for fieldwork decision-making. *Member checks* on preliminary findings occur at subsequent observations, during informal interviews in the field, and during face-to-face semi-structured interviews after completing the preliminary analysis. As theories emerge, participants were asked questions eliciting information about patterns observed by the researcher (Brewer & Hunter, 1989).

Debriefing sessions, peer reviews, and a researcher journal were used to help the researcher remain open to alternative approaches and receptive to challenging assumptions, as well as to examine developing patterns and theories. The researcher's journal provided a complete record of all fieldwork activities, provide places to note the researcher's sense of

findings that need to be checked against data, as well as offer systematic spaces for noting the researcher's impact on the field and the field's impact on the researcher. Through such activities, the researcher's journal can help minimize researcher bias and support the credibility of the study (Guba & Lincoln, 1989).

Transferability provides a way for other researchers to ascertain to what degree the results of one study might apply to another setting. This research provides rich descriptions of Academy High School and of the art activity studied to allow readers to make judgments about transferability of these findings possible. Finally, *dependability* and *confirmability* depend almost entirely on a systematic research process being followed and on careful record keeping along with the establishment of an audit trail. The dissertation chair performed an audit of research findings. An audit trail identifying data sources, and linking data, analysis products, and findings was maintained.

CHAPTER 4

RESULTS

Introduction

This chapter presents the results of the qualitative data analysis used to describe the sample and address the research questions. The chapter is divided into four sections. The first section provides in-depth descriptions of each of the eight participants in the study. The second section summarizes the students' responses to interview questions. In the third section, the research questions are addressed, with a thematic analysis of the study outcomes presented in the final section.

Here, as suggested in earlier chapters, attention has been given to foundational elements of the three disciplines: Place-based Education, Reggio Emilia, and Experience Design. As becomes clearer in what follows, findings related to students' abilities to expand their creativity as they learned, especially what aspects of their learning proved memorial.

On March 14, 2012, the science teacher arrived at the beginning of the class. She laid out posters of pollinators indigenous to Michigan, invasive plants in Michigan, silhouettes of plants and their root systems, and common insects (e.g., bees, wasps, spiders) that are attracted to the pollinators. The lecture ran for 30 minute, with the students enjoying the presentation. Janet and Owen said that the talk was the most positive experience in the art project (Interview 2, 05/04/12, p. 7, 134-139; Interview 4, 05/02/12, p. 21, line 422-428). All students participated fully in the lecture, asking questions where appropriate.

Participants

All of the students in the Advanced Placement Studio Art class who were invited to participate in the study by the researcher's advisor, agreed to participate, which the researcher learned after submitting grades. The present study, integrating an original art project with the environment, encompassed a six-week marking period. This section presents background demographic characteristics of participants that were provided by the students. Demographic characteristics of the sample were obtained from the students. This information was summarized for presentation in Table 2.

Table 2

Demographic Characteristics of Study Participants

Student*	Age	Gender	Grade Level	Future Education
Barbara	18	Female	12	University
Janet	16	Female	11	University
Laurie	18	Female	12	University
Owen	18	Male	12	University
John	14	Male	9	Unknown
Larry	18	Male	12	University
James	16	Male	11	Unknown
Robert	18	Male	12	University

*All proper names were replaced with pseudonyms

The following provides an overview of the students who participated in the study. Each participant was enrolled in Advanced Placement Studio Art class at a large suburban high school. All the participants' in the study were in the Advanced Placement Studio Art class offered at an urban/suburban school in a northern state. The students range in age from 14 to 18 years, including five 18-year-old, two 16-year-old, and a 14-year-old students. Six of the eight students were planning on going on to university, the two remaining students were undecided. Four male

students and 4 female students participated in the study. Four of the group were taking advanced/accelerated classes, two were in regular education, and one was receiving special education services. Of the eight students, four have been in the district since elementary school, two began in middle school, and the other two began in high school. Academically, the grade point averages of the students were above a C average.

Barbara. Barbara knew what she wanted to do from the start, though she and I discussed some minor details. She bent wire into the shape of butterflies and used glass beads strung on the wire to provide color mimicking the colors of butterfly wings. Because her three butterflies were small in relation to the wall on which they were to be hung, I suggested she use available stretcher bars to frame them for a more defined space. Of the six weeks available for the project, Barbara worked about a week on the project. She was often absent and when in class would sleep, shop, or work on things for other classes. She finished the three butterflies on the last day of the card marking. Figure 1 provides a representative photograph of one of her finished butterflies, approximately 12 inches square.



Figure 1 Barbara's Butterfly

Janet. Janet had a number of ideas for the project. She started off wanting to construct houses for the birds, then baths, and ended up making two nests out of wire, reed, and grasses from the garden, approximately 5 inches across (Figure 2). Janet was enthusiastic about the project, spending more time outside than the other students. When another student needed to go outside for reference, materials, and composition, she was willing to accompany the student. She is very open-minded and accepting of others, offering help when she sees others struggling, and is open to receiving help from them.



Figure 2 Janet's Bird's Nest

Laurie. Of the group, Laurie spent the most time on the computer researching art created out of materials found outside. When we took an outdoor tour of the area around school and the pollinator garden, she had a number of questions and took sticks, grasses, and leaves to explore their flexibility and color. For her final project, Laurie used mostly materials found near the school.

Laurie's final project (Figure 3) was based on one of the pieces she had found in her research. The relief sculpture was made up of multiple circle shapes in various sizes made out of the dried vines found near the pollinator garden and reeds. The vines and reeds were secured with wire for their shape and final assembly (approximately 36 inches high and 18 inches across).



Figure 3 Laurie's relief sculpture

Owen. Owen struggled with finding a focus for himself on the project. He actually began construction on four different pieces, finishing none of them. He expressed concern about costs, though insisting he did not need supplies when asked. First, project he planned to create wire frames in the shape of animals, but this ran aground when Owen could not decide on material to fill in the inside of the frame. Although we discussed options, such as grass, plastic bags, and reed. His next idea involved constructing flowers out of wire, making them freestanding and three-dimensional. However, an early attempt proved unsatisfactory, and he abandoned this approach. (Figure 4).



Figure 4 Owen's First Project

Owen's third project was leaf weaving, since he found a "how to" and example when researching project ideas. He worked on the weavings for a week, trying a number of different animal forms, but soon discovered that the grass he was using did not have the length and width needed to make the animals. Ultimately, he realized the example he found used palm fronds, which were not native to the pollinator garden.

Thus, Owen turned to producing a group of origami-like flowers in three different sizes (Figure 5). He folded the flowers, then used markers to give them color, but stems were never attached. Being made of paper meant they could never be used outside. However, this last minute attempt gave him something to turn in before the end of the card-marking period.



Figure 5 Owen's Final Project

John. John knew what he wanted to do from the beginning of the project: a painting of black-eyed susans. He began with a small sketch, then one that was the size of the final project. With the large one, he worked out color and the final composition. When I brought in the board for the final piece, he went right to work. He decided not to prime the board, because, as he said, the color of the wood was nice, a light color and natural looking. He then sketched the black-eyed susans in pencil and spray-painted them with yellow and brown. John was going to outline them with black spray paint, but decided against it because it would cover the pencil sketch and he liked the fuzzy edges of the yellow spray paint. John was the first of the group to finish his project, (Figure 6; approximately 6 feet by 4 feet). His final project was also the first piece to be hung in the garden.

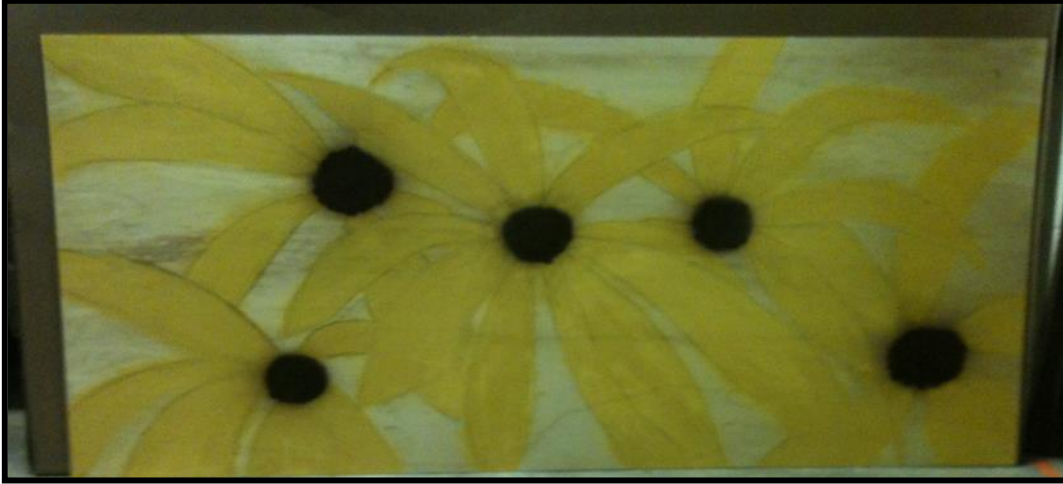


Figure 6 John's Black-eyed Susans

Larry. Larry decided that he was going to make a kinetic sculpture of a flower. He first researched mechanics of making objects move. He looked into solar and wind-powered kinetic sculpture, such as by pursuing the work of Theo Jansens on-line. Jansens' work is extremely complicated, but fascinating. Using got ideas from his research, Larry built cardboard models. He found model construction much harder than he had imagined and asked for my help, which led to his consulting another teacher with experience in kinetic sculpture. Though, Larry subsequently did drawings and produced a number of models out of cardboard, he was not making much progress. This prompted me to suggest that he consult with a race engineer to explore options. They met twice over the course of two weeks and – using plastic bottles, fish line, a hot glue gun and a lighter – Larry built three kinetic columbine flower sculptures that were placed near the columbine flowers in the garden (Figure 7).



Figure 7. Larry's Columbine Kinetic Sculpture

James. James developed a concept for the project and, with a few modifications, stayed with it. He draws, exclusively, super heroes, so his idea was to make a plant-like super hero that would hang on the fence. He planned a plant super hero the size of a traditional poster, containing a green slogan with the image. However, James did not finish the project, getting only half of the figure drawn on the board (Figure 8, approximately 36 inches long and 18 inches across). When the card-marking period ended and I turned in my grades, I asked that he finish the project for the final card marking.



Figure 8. James' work in progress

Robert.

An extremely talented renderer, Robert was resistant to the project. He, initially, was going to do the same thing as Owen, forming wire into the shapes of animals. Robert then decided to do a flower mural similar to John's project. Because he had never painted, he was anxious about attempting it. I suggested that he begin using some of the large rolled paper, sketching the flowers then painting them using tempera to get a feel for the medium. Once he finished a practice piece, he went on to the wooden board, sketched the flowers then painted them (Figure 9, approximately 5 feet by 4 feet), this time with considerable confidence. The piece was finished, he commented that painting was not as difficult as he had imagined.



Figure 9. Robert's Flowers

At the end of the study, the students' art projects were installed in the pollinator garden. The results are presented in Figure 10. Figure 11 presents the pollinator garden as in the middle of August.



Figure 10. Art Projects installed in the Pollinator Garden



Figure 11. Pollinator Garden Mid August

Students' Experiences

The students, upon completion of their art projects for the pollinator garden, discussed their experiences with the researcher in face-to-face semistructured interviews. Their responses provided important information on trying new artistic endeavors, using outdoors for inspiration, appreciation of the environment, impact on understanding the environment, plans to explore environmental issues further, influence on future art, and students' sense of themselves. In working on their projects, the students discovered feelings of empowerment in being able to choose their individual projects, while working cooperatively to create an aesthetically pleasing addition to the pollinator garden.

As a result of using multiple kinds of data collected at different points in time in addition to semi structured interviews, themes emerged. They include; students' experiences, trying new artistic endeavors, using outdoors for inspiration, direct observation and appreciating the environment, impact on understanding the environment, plans to explore environmental issues further, garden experiences influence on future art, students' sense of themselves, nature of the

creative learning experience, incorporating the environment to encourage creativity, collaboration, and being a partner with the environment. What follows is an in-depth exploration into the themes.

Trying New Artistic Endeavors

The students found the most positive experience of the project involved moving out of their comfort areas and trying new experiences. For example, Barbara indicated that she would not have worked with metal, wire, and framing to make butterflies for the garden (Interview 1, 05/12/12, p. 122, line 11-12). Laurie said that working with wood was a new experience that she might not have had if she had not participated in this project (Field Notes, 03/29/12, p. 209, line 227-228). Robert had never painted to a great extent in any art class and he found that mixing colors and creating his first “masterpiece” was fun (Interview 8, 05/04/12, p. 174, line 1080-1081).

Some students developed a better understanding of the relationship between the environment and art. Most of the students had not spent much time outdoors prior to their participation in the study. Janet referred to the science teacher’s presentation and indicated that she realized that Michigan is home to many natural things and they coexist and are interdependent (Interview 2, 05/04/12, p. 128, line 142-143). She became aware of the importance of the plants, insects, and animals in maintaining the environment in Michigan. Owen, after participating in the project, began to view the environment in a different perspective and the importance of recycling everyday objects (e.g., sticks in a yard) and using them “for a greater cause” (Interview 4, 05/02/12, p. 142, line 433-436).

Larry and James pushed themselves to choose a project that was outside of their comfort zone. Larry combined kinetics and engineering with art to create a movable sculpture that was

inspired by Theo Jansen, a Dutch artist known for moving art works (Field Notes, 03/23/12, p. 204, line 116-118). Larry researched kinetic sculptures on the Internet and worked with an engineer to develop the mechanics needed to create movement in his columbines that were made from recycled plastic bottles (Student journal 6, 03/26/12, pp. 192-193, line 229-255). The second student, James, made a superhero based on plants (Student journal 7, 03/26/12, p. 197, line 326-327). James used a poster board to draw and paint his superhero, Plantman, to guard the garden and inform the viewers of the importance of plants and need to recycle (Field Notes, 03/27/12, p. 208, line 201-204). James said that this project made him think because he had no prior reference from which to base his artwork (Interview 7, 05/04/12, p. 168, line 956-958).

Using Outdoors for Inspiration

Five students had not been directly involved with the outdoor environment in creating artworks. Three students, Janet (Interview 2, 05/04/12, p. 129, 159-160), James (Interview 7, 05/04/12, p. 169, line 989-990), and Robert (Interview 8, 05/04/12, p. 176, line 1120-1122), indicated they had used pictures of the outdoors as inspiration for their art, but had not been outside observing the outdoor environment directly. Larry indicated that he had not drawn directly from the environment, indicating that he used nature in creating artworks because “nature itself is art, so of course it influenced me” (Interview 6, 05/04/12, p. 160, line 813).

Owen and John had been involved directly with the environment. While completing an out-of-school assignment at ArtBridge (Birmingham Bloomfield Art Center), Owen was given directions on what he was to accomplish in his artwork (Interview 4, 05/02/12, p. 142, line 443-444). The project that was the focus of the present study was different because he was free to choose the art media that he used for the pollinator garden. John, through his encounters with the environment, saw a relationship between the human form and nature. He saw consistencies in the

ways that plants and humans move and in the presentations of different plants (Interview 5, 05/02/12, p. 150, line 594-597).

Others used the outdoors indirectly. While Janet had not interacted with the environment directly in creating artworks, she considered it to have potential as a way of inspiring future artworks (Interview 2, 05/04/12, p. 129, line 169-171). She also expressed that it could be a way to draw attention to nature and the environmental causes. James indicated that he drew on nature, but through the window. He was drawing a picture of the environment that he was planning to put in his portfolio from inside his home (Interview 7, 05/04/12, p. 168, line 963-965). Robert said that he never used the environment as a direct source of inspiration, although he did look out the window and “noticed that it was a nice setting,” and he preferred staying inside to create (Interview 8, 05/04/12, p. 173, line 1091-1093).

Most students had not interacted directly with the environment, although through their participation in the present study, they found value and application for future artwork. Some of the students viewed nature vicariously and applied what they saw through the windows and in pictures to provide inspiration for their art.

Many of the students rose to the challenge and enjoyed the experiences associated with moving out of their comfort zones. They became more engaged with each other through collaboration and cooperation. The students developed a better relationship with the environment and the collective and individual work associated with the pollinator garden. The project clearly helped them see the outdoors as inspiration for art.

Direct Observation and Appreciating the Environment

All of the students indicated that this type of art experience using direct observation had influenced their appreciation of the environment, but to varying degrees. Two students, Barbara

and James, saw how they could incorporate nature into the types of art projects they made. Barbara, who drew manga anime (Japanese) figures, was planning to use nature in her future drawings (Interview 1, 05/02/12, p. 127, 123-126). James indicated that he could use nature and the environment as settings for his superhero drawings (Interview 7, 05/04/12, p. 169, 989-991).

Larry, Janet, John, Owen, Laurie, and Robert saw a bigger picture for the use of nature and the environment in their future work. Larry hoped to find ways to complement or encourage the growth of native plants in the environment (Interview 6, 05/04/12, p. 162, line 840-842). Janet wanted to continue involvement with the pollinator garden and the “green” team at school (Interview 2, 05/04/12, pp. 131-132, line 206-220). She indicated that she wanted to make an impact on nature, with participation in this project opening her eyes regarding the environment and the need to protect it. John said that appreciating nature and the environment was the right thing to do (Interview 5, 05/02/12, p. 155, line 699-704). He planned to continue to be involved with the green team and to incorporate nature and the environment in his artwork. Owen was involved with the “green” team prior to participation in this art project and he recycled materials into his art project as a way of cleaning up the environment (Interview 4, 05/02/12, p. 148, line 561-566). Laurie indicated that she had become more aware of the environment through her participation in this study (Interview 3, 05/02/12, p. 139, line 368-372). However, she was more focused on preparing for college in the near future. She wanted to become more involved in using the environment in her future art as a political tool to make others aware of the need for environmental conservation. Robert, while becoming more aware of the environment from participation in the art project, was disengaged from being directly involved with the environment. Instead, he wanted to remain inside and observe nature through the window (Interview 8, 05/04/12, p. 174, 1091-1093).

Students' responses suggest a greater awareness about the environment and appreciation of nature. More than half of the students saw a greater application of nature and the environment for future work and making a difference. Some of the students were less enthusiastic and chose to use nature in their own personal work, but were not planning to become advocates of conservation.

Impact on Understanding the Environment

Four students felt the project had an impact on their understanding of the environment, regardless of prior knowledge. For instance, Janet developed an understanding of how native plants provide a foundation for insects to live and from there other species are able to thrive (Interview 2, 05/04/12, p.128, line 140-144). She became aware that the environment is a mutually supportive system that needs all its many components to succeed and thrive (Field Notes, Student 2, 03/27/12, p. 251, line 1089-1090). Laurie also began to understand the relationship between plants, insects, mammals, and humans; as well as the importance of protecting what people have to be sure there is no more destruction of the environment, since extinction is forever (Interview 3, 05/02/12, p. 38, line 342-347). According to John, the point of the assignment and its relationship to the environment was a consideration. He asserted there was a greater purpose beyond the making of art, but the making of art was critical to the project's success (Student journal 5, 03/19/12, p. 190, 189-193). The aesthetic choices John made in deciding on his art project were intended to provide communication with the user of the garden regarding the value of the environment (Interview 5, 05/02/12, p. 153, line 655-659). James began to understand the plants are native to an area and grow best when cultivated in that environment (Student journal 7, 03/15/12, p. 197, 318-324).

Owen and Larry both came to the project with some previous knowledge of the environment and environmental issues. For Owen there was an increased appreciation for the fragility of the environment and an interest in incorporating environmental issues in his future artwork (Interview 4, 05/02/12, p. 142, line 431-437; p. 144, line 481-483). Larry found that he developed a better understanding of the fragility of the environment by increasing his awareness and involvement in the environment with this project and the importance of “doing little things because they can make a big difference” (Interview 6, 05/04/12, p. 162, line 851-852).

Barbara and Robert expressed minimal growth, relative to the group, in understanding the environment. Barbara expressed “a little more understanding,” but since her artistic focus was on the single character manga style of drawing, it seemed an understanding of the environment and environmental issues was not relevant to her artistic endeavors (Interview 1, 05/02/12, p. 124, 55). Robert said he did not have an “issue” with the environment but that he had a better understanding of what flowers looked like so that would help him draw flowers as objects in the future (Interview 8, 05/04/12, p. 176, 1127, 1132-1134).

Student responses generally suggested that they had a greater understanding of the environment following their participation in the study regardless of their level of awareness before the project. More than half of the students expressed their understanding of the relationships between plants in the pollinator garden, insects, mammals, and humans, as well as their dependency. Two students expressed a better understanding of the environment, but found little value in the knowledge.

Plans to Explore Environmental Issues Further

Four of the students, Janet, Laura, Owen, and, Larry, were positive about the need to become more involved in the environment as a result of their participation in the study

(Interview 2, 05/04/12, p. 129, line 159-162; Interview 3, 05/02/12, p. 137, line 362-331; Interview 4, 05/02/12, p. 144, line 481-483; Interview 6, 05/04/12, p. 161, line 820-823). They considered that this issue was important, but they also indicated that their immediate focus was on their next step, college. John viewed participation in environmental protection as a moral issue, but did not plan to become involved in any environmental groups (e.g., Green Team at school) to support nature and the environment (Interview 5, 05/02/12, p. 153, line 665-670).

Janet and Owen were involved in social consciousness activities associated with the environment (Freeze for Genocide, Green Team, etc.; Interview 2, 05/04/12, p. 132, line 225-231; Interview 4, 05/02/12, p. 147, line 546-548). Owen had different ideas to extend the progress toward being green, such as recycling. He had participated in a technology class that built an electric car that used energy collected from wind force.

In contrast, Barbara, James, and Robert, did not plan to become involved in environmental protection issues. They understood the importance of protecting the environment, but chose to be supportive, but uninvolved (Interview 1, 05/02/12, p. 125, line 84-89; Interview 7, 5/4/12, p. 141, line 1019-1024; Interview 8, 05/04/12, p. 177, line 1152-1156).

An awareness of environmental issues increased for all of the students; however, their future plans differed substantially. While four students were likely to become actively involved in protecting the environment, three were more inclined to remain on the sidelines. For students who wanted to help the environment, two were already involved and two were aware of the need, but wanted to focus on the next step in their lives, namely college.

Garden Experiences Influence on Future Art

Students reported that the garden experience would have varying influence on their art in the future. Five students, Janet, Owen, Larry, James, and Robert, indicated that their participation

in this study would influence their art in the future. Janet said that she would probably incorporate “light” into her future drawings, in a fashion similar to Monet who did many series of paintings that focused on the effects of light on inanimate objects at different times of the day (Interview 2, 05/04/12, p. 133, line 254-258). Owen explored a variety of art mediums, but never fixed on a specific type. Now that he has completed the exploration, he wanted to include nature as another medium for future projects (Interview 4, 05/02/12, p. 148, line 561-566). Larry envisioned himself as broadening his artistic repertoire to include nature, kinetic sculpture, and the incorporation of different structures and colors in the creation of plant-like sculptures (Interview 6, 05/04/12, p. 159, line 791-796). Using the environment as inspiration was a new way for James to grow and mature as an artist. He could now see himself going outside to draw pictures of plants and insects at home in the environment (Student journal 7, 05/01/12, p. 197, line 318-324; Interview 7, 05/04/12, p. 168, line 963-965). Robert wanted to use his observations of the environment in creating three-dimensional computer games. In previous game creation, he had used the environment, but always from the inside looking out and not as incorporating the textures of the environment into the game (Interview 8, 05/04/12, p. 178, line 1161-1168).

Other student responses suggested only tentative influence on their art. Barbara indicated that she might incorporate the environment as part of her manga drawings, but at the present time, her manga drawings included only the figure (Interview 1, 05/02/12, p. 124, line 55-60). Laura envisioned her use of the environment would be as a political outlet that could help the public understand the need for change (Interview 3, 05/02/12, p. 139, line 368-372).

The students all perceived that their involvement in all art project that incorporated the environment would influence their future work. However, their use of the environment differed among the students, partially based on their future plans (continuing as an artist or going into

other types of careers, etc.). The overarching responses were that their exposure to the environment had a positive effect on their feelings about the environment and the need to protect it in the future.

Students' Sense of Themselves

All participants felt as though they were special and that the project was important to the future of environmental issues and education in general. The garden project was open-ended and students reported being encouraged to explore ideas and create their own projects, which was a change from other classroom experiences (Interview 1, 05/02/12, p. 122, lines 9-14; Interview 2, 05/04/12, p. 120, lines 159-163; Interview 3, 05/02/12, p. 135, lines 285-291; Interview 4, 05/02/12, p. 149, lines 582-585; Interview 5, 05/02/12, p. 153, lines 665-670; Interview 6, 05/04/12, p. 165, lines 916-922; Interview 7, 05/04/12, p. 168, lines 956-958; Interview 8, 05/04/12, p. 179, lines 1180-1188). In addition to a belief they were contributing to a greater environmental cause, three students (Janet, Laurie, and Larry) enjoyed the ability to choose their projects based on their research. All three expressed a sense of ownership in their projects that they had not experienced before at this point in their education (Interview 2, 05/04/12, p. 134, lines 263-265; Interview 3, 05/02/12, pp. 140-141, lines 140-141; Interview 6, 05/04/12, p. 159, lines 791-796). Additionally they were able to focus on their interests based on research they had done in preparation for the creation of their piece. They all expressed a better understanding of and interest in supporting the environment and environmental causes in the future (Interview 1, 05/02/12, p. 125, lines 84-89; Interview 2, 05/04/12, p. 131-132, lines 246-248; Interview 3, 05/02/12, p. 139-140, lines 368-400; Interview 4, 05/02/12, p. 146, lines 523-528; Interview 5, 05/02/12, p. 155, lines 699-704; Interview 6, 05/04/12, p. 164, lines 895-901; Interview 7, 05/04/12, p. 171, lines 1017-1024; Interview 8, 05/04/12, p. 177, lines 1142-1145).

Larry also said he “felt special, so special,” that his notebook and other things would be used out in the world by other people. Other people would wonder who the information came from. He anticipated that they would wonder, “Is this what the students were working on?” (Interview 6, 05/04/12, p. 166, lines 940-947). He said that the work is amazing and that people may become more aware of the role of art in the environment.

Owen and John had similar feelings of being part of a greater cause, on both a personal and global level. In Owen’s case, his extended explorations resulted in a disappointing performance as far as he was concerned (Field Notes, Student 4, 04/26/12, p. 230, lines 643-644). Because he saw the project as something more, his product needed to be substantial, as well as a statement of his sense of commitment to the project and the underlying concept (Interview 4, 05/02/12, p. 149, lines 582-585). John viewed his participation as a learning opportunity that he could bring to his future college experiences, one that was supportive of his existing moral beliefs; all of us have a responsibility to each other and the space in which we live (Interview 5, 05/02/12, p. 155, lines 699-740). John indicated that his involvement was a vehicle to inform others of their responsibility as world citizens (Interview 5, 05/02/12, p. 158, lines 769-771).

Barbara, James, and Robert were the least enthusiastic about their participation in the art project. While they had fun in creating the art projects for the garden, they were not likely to venture out into the environment or get involved in environmental programs in the future, though they had a better understanding of the need (Interview 1, 05/02/12, p. 125, lines 84-89; Interview 7, 05/04/12, p. 171, lines 1015; Interview 8, 05/04/12, p. 177, lines 1152-1156). Although Barbara created butterflies as her art project, she indicated that she was not going to create environmental art. However, she would begin incorporating some environmental aspects in her

focus on Manga people (Interview 1, 05/02/12, p. 126, lines 97-103). Robert had fun doing the project and ventured into a new art medium (painting), but his participation would not have a significant influence on his sense of the environment in future projects (Interview 8, 05/04/12, p. 175, lines 1109; p. 178, line 1161-1168). James wanted to work harder, but seemed to lack the maturity and commitment to complete his project in the time allotted (Field Notes, Student 7, 04/27/12, p. 233, lines 696-700).

The students were grouped by their interest to the environment during the art project. The first group was more focused on the environment as a vehicle for research and creativity in developing and completing their art projects. They were the most likely to continue their involvement in the environment and protecting it in the future. The second group of students enjoyed participation in the art project and were more aware of the environment following completion of their art projects. However, they were not as likely to take up the environment as a cause in the future. The last group of students were not interested in the environment, but were more concerned about having fun and working on new projects or using different art media than in prior projects.

Nature of the Creative Learning Experience

Beginning with the talk by the science teacher (Transcript Appendix A), the students became aware of the types of flowers and plants that could be incorporated in the garden, as well as the kind of insects that would be attracted to the plants. The art teacher (and researcher) provided a detailed timeline for the project (Table 3).

Table 3

Planned Time Line for the Art Project

Week	Planned Activities
Week 1	Science teacher presented information on pollinator garden and native plants. I presented information on the use of natural, found, and recycled in creating art. Students and I toured the grounds around school and the pollinator garden discussing found materials that could possibly be used in the making of their projects.
Week 2	Students did their own research and preliminary sketches of possible projects.
Week 3	Students who are working on paintings (6' x 4') began to draw their designs on the large rolled paper, then paint them. Students working with other materials began to assemble the components for their piece.
Week 4	Discussions with all students about their projects, including any technical, design, material problems and progress assessment.
Week 5	Continue working on projects. With only 1 more week remaining on the project, progress with a few students is discussed.
Week 6	Finish projects, group critique, and hanging of the work on the wall in the pollinator garden.
Day after the end of the card marking. Field trip to the Oaken Transformations Sculpture & Poetry Walk.	

The students, after their initial introduction to the art project, began planning their work. Students felt empowered to make the decision on what type of art project they would create for the garden. First, they looked at the environment, then researched other environmentally focused projects on the Internet, and began defining their projects. They began planning how the art works could be incorporated in the pollinator garden and be artistically appealing, functional and support wildlife, meet the teacher's criterion of being weatherproof, and enhance the overall environment. During the production period, their projects changed from input from other members of the group, demands of the available materials, and their individual motivation to complete their projects within the time frame.

Both Janet and Laurie commented in their journals that after the science teachers' talk, they grasped the concept of how plants adapt to the earth and climate to create beautiful reactions. Using this information, they began to research the types of projects that could complement the garden. Janet stated, in her journal, "how native plants affect the environment

and now [I] understand how they support different insects and animals” (Student journal 2, 03/15/12, p. 183, line 64-67). Laurie indicated that she “grasped the concept of how plants adapt to the earth and the climate creates beautiful reactions. Studying nature in the surroundings can help create beautiful artwork. Adaptability is key to creating masterpieces” (Student journal 3, 03/25/12, p. 185, line 115-118).

Larry commented that “ecology is complex, that green is actually a rainbow of mischief and new horizons. My conceptual skills have evolved. Knowing what I have known and learning what I thought I learned are two situations that allowed me to think outside of the box” (Student journal 6, 03/26/12, p. 194, line 264-267). Larry’s journal provided insight into his growth as he felt that he could take chances, change it [his art project], and if he made a mistake he could upgrade it, update it, and allow it to evolve. He now was aware that his artwork was on a continuum and did not necessarily have a beginning or end. Creativity, according to Larry, was about growth and development.

After the science teacher’s talk, the teacher and students discussed the types of artwork that would be most appropriate. The teacher’s only criterion was that the art project must be weatherproof. After searching on the Internet, she showed samples of artworks that had been exhibited outdoors. The majority of these exhibits was assembled from natural elements. These projects included recycled materials, organic materials, and intentionally temporary art [sand sculpture] that would decompose over time.

The students then turned to the computer to research possible projects, many of which were similar to those that the teacher had discussed (Field Notes, 03/23/12, p. 203-204, line 98-121; 04/10/12, p. 210, line 238-239, 244-245). The students also walked over to the pollinator garden being planted with native plants. For many students, this represented the first time they

had gone outside specifically to look at the environment (Field Notes, 03/21/12, p. 201, line 48-63). The students appeared to enjoy the creative experience of exploring options for their art projects. They shared their ideas and findings, with each student initially deciding on a unique project.

The teachers' observations of the students indicated that while they were willing to create environmentally appropriate artwork for the pollinator garden, they generally were working outside of their comfort zone. They had not been exposed to nature and the environment. For example, Robert, during his interview, stated that he "never thought about actually going outside, sitting in the grass, drawing a picture of a tree or a flower or anything like that. [He continued] . . . that [he] had drawn elements of the environment, but only while sitting inside [his] studio, looking out the window" (Interview 8, 05/04/12, p. 174, line 1091-1093).

Incorporating the Environment to Encourage Creativity

For some students, venturing out into the pollinator garden for the first time was a new experience. Their previous involvement/relationship with the environment was typically confined to the space from which they moved from point A to point B (e.g., parking and going into a store). Beyond concerns for personal safety in the environment, most students were unaware of the interdependence of plant and animal life that is supported in the garden.

When the students began researching possible art projects on computers, they realized the enormity of possibilities. Janet wrote in her journal that she did not realize the lines and angles that were possible in the environment (Student journal 2, 04/16/12, p. 184, line 190). Laurie began to see the environment as art (Interview 1, 05/02/12, p. 126, line 96-99), and Owen wanted to use the collected grass to create a grasshopper to understand the environment better (Field Notes, 04/11/12, p. 211, line 254-255). Janet found that being in the garden sparked the idea of

building an organic bird feeder (Student journal 2, 03/26/12, p. 183, line 79-80). She was beginning to see how that creating art could include things that were functional, beautiful, and environmentally friendly. Similarly, Laurie wrote:

The whole perspective on nature's creativity, I began to grasp the concept of how plants adapt to the earth and how the climate creates beautiful reactions. Now I created an idea for me to do for the project, studying nature and my surroundings and adapting to them can help me create a beautiful work of art. (Student journal 3, 03/26/12, p. 185, line 111-115)

Larry named the project "the creative endeavors" (Student journal 6, 03/15/12, p. 191, line 206). When the project was first explained to him, he felt that it would be impossible because creativity was not a tangible thing. He explained that creativity could not be taught, it was internal, not external. Additionally, he wondered how creativity could be measured or monitored as an abstract characteristic, especially in the arts where not only does creativity differ, but individuals differ. Larry found *his* definition of creativity through the project. He defined it as a collection of new experiences, challenges, and techniques, as well as the discovery of new abilities and application of new skills needed to create new art projects (Student journal 6, 03/15/12, p. 236, line 209-213).

Collaboration

All eight student participants found the project educationally liberating, because the only specific requirement was that the final product, when completed, had to withstand the elements, year round in the pollinator garden. With that as the only criteria, the students felt a freedom to research, choose, and create whatever they found interesting to them and met the specific requirement.

Janet, in the final interview, said she would think about and research the project at home (Interview 2, 05/04/12, p. 133, line 261-265). Because she had not been told what to do, she was

able think creatively and came to school interested in discussing her discoveries with others in the group. Owen, in his journal, wrote that the group discussions might have resulted in his many unfinished projects (Student journal 4, 05/01/12, p. 188, line 157-161). He continued, saying that so many ideas and new projects were discussed that he found it hard to choose a single one on which to focus. As noted in the researcher's field Notes, Larry gathered research by collaborating with students in class, other teachers (science and TV production; Field Notes, 04/12/12, p. 212, line 285-291), and a race engineer (Field Notes, 03/26/12, p. 206, line 156-158). In his journal, Larry commented that the open-endedness of the project gave him the freedom to explore and learn in a way that best suited him, which was heavily based in collaboration (Student journal 6, 03/26/12, pp. 13-14, line 222-248; Field Notes, 03/23/12, p. 204, line 116-118).

The researcher's field Notes indicated that all students found the collaborative experience useful (Field Notes, 03/23/12, pp. 203-204, line 98-126). All students found the experience liberating, including those students who were struggling with the project's open-ended approach and those who saw it as an opportunity to explore learning in a collaborative, cooperative, and noncompetitive environment. These experiences resulted in the borrowing or building on other students' ideas. This observation was most discernible with Robert who moved from creating wire animal sculptures similar to Owen's project to creating a mural painting similar to John's work. For example, Robert and Owen attempted to create three-dimensional figures for the garden. Owen attempted to use several types of media for his project (e.g., wire animal sculptures, chicken wire to create dimensional animals and plants, sculptural pieces made of grass, wire flowers), before completing origami paper flowers. Robert conceptualized several of Owen's projects on the computer, but never actually attempted any of the plans. Instead, he completed his project by creating a painting of colorful native flowers that was similar to, but

different from, John's bi-colored work of black-eyed susans. The researcher recorded instances of positive collaboration among the students in her field Notes and reflective commentary.

Collaboration in this project seemed to evolve into four different educational outcomes. The first outcome offered opportunities for the group to share their personal research, using a give-and-take exchange that resulted in educational exposure and growth for all the students. Following presentations by the science teacher and myself, the students collaborated as they began their research on potential projects. During the research phase of the project they would make a discovery and call the others over to share in the discovery (Personal Journal, 03/22/12, p. 272, line 49-50). This collaborative educational approach was different for some members of the group. For example, during the district open house in the fall semester, Owen, Larry, and Robert were in active competition with one another, displaying their work on the drafting tables for attention from the visitors (Personal Journal, 03/22/12, p. 272, line 65-72). When students began working on their projects, they would turn to one another for help if they had technical and/or conceptual problems (Personal Journal, 04/26/12, p. 275, line 118-124). No observable physical assistance was noted among the students with the creation of the projects, except for hanging the completed artwork in the garden (Personal Journal, 04/27/12, p. 275, line 129-131).

The second outcome was evident after the students had completed their research using computers and began working on their projects. The breadth of new information and research sharing created a distraction for some students, resulting in multiple unresolved projects. Owen and James were distracted from completing their projects because of the exciting information they, as well as the others in the group, came across during their computer searches. Owen became involved in the multiple creative options he and others discovered (Field Notes, 04/27/12, p. 232, line 674-678, Interview 04, 5/2/12, pp. 143-144, line 463-473), and James often

became excited and distracted because of all of the information derived both from others in the group and from his own computer research. Having opportunities to research, learn, and share new information, at times, overwhelmed James (Student Journal 7, 04/16/12, p.197, line326-327; 05/01/12, p.197, line 333-334).

On occasions when students collaborated, many opportunities to learn and explore in different ways presented as the third educational outcome. Because the students found they were encouraged to seek information from multiple sources, they explored as many sources as they deemed necessary to proceed with creating an artwork for the pollinator garden. John became an active participant in all aspects of his project, including hanging the piece. After discussing how it was to be hung with another student (Field Notes, 03/26/12, p. 205, line 144-146), he went to the principal to discuss hanging the piece (Field Notes, 03/23/12, p. 204, line 113-114). Larry collaborated with many different people: engineers, teachers, and students. He might not have understood the need to work with anyone outside of art prior to beginning this project. In his collaborations, he obtained the necessary information to build his kinetic sculptures successfully (Field Notes, 03/26/12, p. 206, line 156-158, 04/12/12, p. 212, line 285-292, p. 215, line 337-340). While Owen and Robert were friends outside of school, they were minimally competitive regarding their art. For this project, Owen was adventurous, with Robert preferring to observe (Personal Journal, 03/22/12, p. 272, line 50-54). This relationship was different from the historic dynamic between these two friends. Janet, who floated between groups (Personal Journal, 03/22/12, p. 272, line 56-58), said in her interview that collaboration was more about expanding her understanding of environmental issues specific to Michigan than in deciding on an art project for the pollinator garden (Interview 2, 05/04/12, p. 131, line 206-311).

The fourth and final educational outcome related to how collaboration was used as source material when students were having difficulty grasping the project because the identified parameters were beyond their creative comfort zones. When specifics of their projects were discussed individually, including the single parameter of the piece being able to withstand the elements, the students, for the most part, opted to stay in their comfort zone (Field Notes, 03/22/12, p. 202, line 82). As time, research, and experimentation passed, the willingness of the students to expand on their original ideas was supported by collaboration amongst the group. When Robert appeared overwhelmed by the openness of the project, Owen's willingness to consider options provided support to the endless possibilities to be explored (Personal Journal, 03/22/12, p. 272, line 50-54). Robert was able to find direction through Owen's explorations. Janet commented that she would think about the project outside of class (Interview 2, 05/04/12, p. 133, line 261-263) and talk to friends both in and out of school to grasp the instructions (Personal Journal, 03/22/12, p. 272, line 56-57). She elaborated, "You didn't really tell me [what to do], you just said the instructions and you let us be creative with it" (Interview 2, 05/04/12, p. 134, line 263-265). The researcher commented in the interview that Janet had tried a number of things and did a lot of exploring. Janet said she found the freedom to research and share helpful ideas for understanding the environment and building a deeper understanding of what is good for the environment (Interview 2, 05/04/12, p. 130, line 193-195).

The students' interactions evolved from functioning in isolation to actively competing to working collaboratively as they developed unique art projects that could be used harmoniously in a single venue, the pollinator garden. Given an open-ended assignment with little direction provided freedom to most of the students to research, plan, and create products that required them to use skills and talents that had not been used in their previous work.

Similar to Reggio Emilia (Rinaldi, 1998), the study found that the students, as a result of their collaborations, became more connected both in and out of the classroom. The researcher's field Notes indicated that all of the students helped in hanging the art projects as they were completed (Personal Journal, 04/27/12, p. 275, line 129-131). Previously, the students' art projects were completed in isolation, with little interaction occurring. In his interview, Larry found the collaborative aspect of this experience was positive because he did not feel like he was working alone (Interview 6, 05/04/12, p. 166-167, line 942-947). The students were working toward a common goal, providing art works for the pollinator garden that would add to the beauty of the school. Janet, in her journal, wrote that her artwork would enhance the environment and last beyond her tenure at the school (Student journal 2, 03/26/12, p. 183, line 77-78).

Being a Partner with the Environment

For seven students, participation in this art project was their first focused experience with the environment. Prior to their projects, many students had minimal interactions with the environment and did not understand how their ecological behaviors (e.g., recycling, reusing, reducing waste, etc.) affected the world around them. The extent of their exposure to the environment before and during the art project directly influenced their expected level of continued collaboration with the environment, as well as incorporation of alternative media in their pieces. Nonetheless, students in various ways found their projects through collaboration, research, and environmental awareness.

Of the eight participants, three incorporated materials intended for another use in their art projects, three explored, but did not use alternative products, and two chose to use new materials for their projects. The three students, Janet, Laurie, and Larry, who incorporated found, or existing materials, expressed a consciousness for the environment and an interest in minimizing

their contributions of “stuff” into the environment. Janet (Field Notes, 03/27/12, p. 251, line 1089-1096) and Laurie (Field Notes, 03/27/12, p. 246, line 974-980) used materials found in and around the pollinator garden. Janet’s project focused on function, while Laurie was concerned with decoration. Both used wire as either a foundation or connective material, but focused on materials (e.g., grasses, vines, and twigs) found in the garden for their project. Janet, in her journal, initially wanted to create an organic birdfeeder with materials from the garden that would be “both efficient, as well as environmentally friendly” (Student journal 2, 03/26/12, pp. 183-184, line 79-81). Larry, following discussion of the engineering segment of his kinetic sculpture with the engineer, used recycled pop bottles and fishing line to create his “columbine” flowers (Field Notes, 03/26/12, p. 242, 877-880).

Owen and Robert planned to use chicken wire in their original art projects. Owen began with a plan to form animals out of the chicken wire and then use recycled grocery store plastic bags to provide color and give the animals’ dimension (Field Notes, 03/27/12, p. 208, line 196-197). Robert wanted to use the chicken wire to create palm trees for the garden (Field Notes, 03/27/12, p. 249, line 1055-1082). After making the tree trunk and leaves, he expected to use plastic grocery bags from stores to make the trunk and leaves. However, he realized that palm trees were not indigenous to the environment and as the pollinator garden included only native plants, his original plan was not appropriate.

John wanted to create letters for the garden similar to graffiti (e.g., letters or words spray painted on a wall), making them from moss (Field Notes, 03/27/12, p. 247, lines 994-995). However, he found it difficult to determine how to attach letters to the wall and have the moss continue to grow in an uncontrolled setting. He also was unsure what medium the moss needed

to thrive in the garden. While his idea was interesting, he came to realize the project was beyond both the time allotment and available materials.

Two students, Barbara (Field Notes, 03/28/12, p. 256, lines 1213-1239) and James (Field Notes, 03/28/12, p. 259, lines 1288-1289), did not consider using any materials beyond those that were new and could be purchased. Their projects, the butterflies and the unfinished plant super hero, fell into their comfort areas. While the butterflies were creative, they fell more in an arts-and-crafts genre. James' incomplete super hero could not be hung in the pollinator garden (Field Notes, 04/27/12, p. 233, lines 696-700).

Thus, students tried to incorporate the environment to some extent in their initial art project considerations, with Robert, Barbara, and John having the weakest connection and Janet, Laurie, and Larry having the strongest. All of the students determined that their initial attempts were too ambitious, often because of technical difficulties, site-specific problems, and mismatch with the native plant pollinator garden (Field Notes, 03/29/12, p. 201, line 225-229). As the students became aware of these difficulties early in the project, they changed or adapted their initial plans to projects that were appropriate for their abilities and could be completed in the period allotted for the study. As such, their decisions about their projects illustrate how they collaborated with the environment, as well as how some repurposed natural materials for their art.

Summary

The chapter has provided the results of the analysis that were used to describe the participants, address the research questions, and develop domains that emerged in the study based on student interviews and journals and teacher field Notes. The four educational outcomes that emerged from the findings focused on research and collaboration. The students, through the

science teacher's talk, developed a foundational understanding of the environment and the importance of preserving native plants in the pollinator garden. Using computers for research on possible topics, the students began to define their art projects for the garden. Through collaborative discussions and noncompeting ideas, their art projects emerged with various levels of success. All but two projects have found a home in the pollinator garden. The students came away from the research, learning how to take a problem, conduct research, collaborate with other students and teachers, and develop an art product that required them to move out of their comfort zones. A discussion of the findings and implications for further research can be found in Chapter 5.

CHAPTER 5

SUMMARY, DISCUSSION, AND RECOMMENDATIONS

Introduction

To restate, the purpose of this study was to investigate the effects of participation in an art project that integrated environmental awareness and creative learning experiences for students enrolled in High School's advanced placement studio art. This study explored individual elements of three environmentally centered disciplines of place-based education, Reggio Emilia approach, or experience design to determine if students' abilities to expand their creativity to learn were supported. While different elements were examined, this study focused on the foundational elements of three disciplines: place-based education, Reggio Emilia, and experience design. The findings of the study were based on interview responses, student journals, researcher's field notes and personal journal, as well as the finished artwork created by the students.

Specific elements within the three approaches of place-based education, Reggio Emilia, and experience design were examined. These approaches provide support for using place as a learning tool in helping students develop an understanding and connection to their environment. The study focused on how experience, relative to place, can be used to develop a foundation for continued personal, social, cultural, and environmental growth and awareness. The project also supported the use of nontraditional collaborations to build on-going, life-long learning experiences. The study provided students with a sense of empowerment that was absent in other classes as they made decisions regarding their projects. The over-all influence of a deeper understanding, appreciation, and partnership with one's environment through the freedom of expressing personal creativity is part of the empowering experience.

Ultimately, place-based education and Reggio Emilia's focus on education provide structure for helping students understand how "place" enhances experiences, creates opportunities for collaboration, and a sense of partnership with the environment. Place refers to the influence of the physical environment on the student and their work in the study. From these partnerships, students develop an understanding of what could improve individual creativity and an increased sense of place.

Placed-based education appears to hold opportunities for high school students. Despite a substantial base of information obtained from younger students (Sobel, 1999), Reggio Emilia focuses almost exclusively on pre and primary school students (Tarr, 2001). Learning tools of place, student-centered learning, collaboration, and problem solving are not constrained to those under the age of seven years, raising interesting issues about how foundational learning techniques developed in young students might be supported instructionally in middle and high school.

High school students failed to attract the attention of experienced design practitioners. While experience design focused on objects' usefulness in a particular place and on support of users' needs in that place, designers studied people from 35 to 55 years of age (Buxton, 2009). Although high school students routinely interact with designed objects in everyday life, input from them has not been included in studies about such objects. Thus, the extending premise of this study includes expanding research on place-based education, Reggio Emilia, and experience design to include high school students. These practices have the potential to offer high school students' opportunities to develop understandings about the myriad ways that experience, collaboration, place, and partnership within one's environment could improve creativity and connectedness with their world.

Discussion

Four research questions were developed for this study. The questions were designed to provide a basis to understand how participation in this type of art project that integrated science and art in a single pollinator garden affected the students.

The first research question focused on how the students perceived the nature of their creative learning experiences. Initially, the students were enthusiastic about participating in the project that was intended to add art to a school pollinator garden populated with native flowering and vegetable plants. They listened to the science teacher's lecture about pollinator gardens and the researcher's discussion of the use of different media (e.g., recycled, found, and natural materials) that could be turned into art. The researcher gave them a single criterion for their project; the artwork had to be permanent enough to withstand Michigan weather. As they were instructed to develop their own projects, they walked in the garden and used internet connected computers to find different types of projects that could be completed in the six-week period.

The students collaborated with each other, making suggestions and commenting on each other's ideas before each student settled on a project. However, all of the students changed their minds multiple times before completing their final project. The primary theme that emerged from this process was feelings of being empowered to be creative. They commented that this art project was the first class where they controlled their learning and creative experiences.

This class was similar to the Reggio Emilia approach that used a self-guided curriculum where students learned respect and responsibility for the environment, supporting their innate needs to explore and create (Reggio Children, 1996). The outcomes of this class also echoed the use of place-based education that encouraged students to develop a greater voice in their education. Students became energized with a renewed sense of value in the local environment

(Smith, 2002). Place-based education incorporates multiple learning approaches, collaboration, problem solving, independent and cooperative tasks, student initiated learning, and interdisciplinary learning (Sobel, 1999). Both the Reggio Emilia and the place-based learning approaches require students to take responsibility for their learning; and this track empowered them to research, select, and execute their ideas for adding art to the pollinator garden. Through this empowerment, they were able to work independently and collaboratively across disciplines to enhance the pollinator garden.

The second question focused on the extent to which these experiences incorporated the environment and encouraged creativity. All students in the study indicated that they became more aware of environmental needs, and the effect of this awareness on their creativity. When asked to define creativity, Larry, in his journal, wrote that he had named the project “the creative endeavors” (Student Journal 6, 03/15/12, p. 191, line 206). When the project was first explained to him he felt that it would be impossible because creativity was not a tangible thing, meaning creativity could not be taught, it was internal, not external. Additionally he wondered how creativity could be measured or monitored as an abstract characteristic, especially in the arts where not only creativity differs, but individuals differ as well. Larry found *his* definition of creativity through his work on the project. He defined it as a collection of new experiences, challenges, and techniques, as well as the discovery of new abilities and application of new skills to creating new art projects (Student Journal 6, 05/01/12, p. 195, line 302-04).

The challenges of working with the environment were reflective of the Reggio Emilia philosophy that encourages problem solving among peers, creative thinking, and creative exploration (Gandini, 1998). The students in the present study learned about the environment and

used that new knowledge as the starting place for their exploration of the integration of art and science.

The third research question focused on how and to what extent educational outcomes emerged from the art experiences that offered opportunities for collaboration among students. The students after listening to the science teacher and researcher began planning their projects, using computer searches and dialogue among themselves regarding feasibility of specific techniques or media. The students, some of whom had been competitive at the beginning of the school year became collegial while making decisions on the various art projects. This collegiality did not extend to physically helping one another with the completion of the projects, but was evident in the discussions about the pros and cons of potential art projects during the planning stage.

The extent of information obtained during the research phase of the project overwhelmed some of the students, resulting in problems in completing their artwork. Owen became involved in multiple creative options as a result of collaborating with other students (Field Notes, 04/27/12, p. 232, lines 674-675). Though Owen was dissatisfied with his final project he did explore several media options he may not have otherwise. He explored and learned how different media responded to his manipulation. Despite not having a project that could exist in the pollinator garden at the end of the six weeks, Owen expanded his knowledge through personal research and collaboration with other students.

The last question asked to what extent such experiences supported students to develop partnerships with the environment and allow alternative uses for a product. While awareness of the environment and environmental needs was well documented in the student interviews, the alternative use of products/materials was evident in Larry's appropriation of plastic bottles for

his kinetic columbine flower sculptures, Janet and Laurie's use of vines and grasses in their final piece, Owen's exploration of grass as a sculptural tool, and John first wanted to use moss as the vehicle for his graffiti art. While Larry's use of plastic bottles was the only direct appropriation of product, the use of grasses and twigs in the other's exploration and creation demonstrated an alternative use.

The overarching finding in this study was the growth of students in multiple dimensions. The students became more aware of the environment and its linkage with art. They appreciated the value of native plants and their importance in the ecology of the world. The students moved beyond their comfort zones of drawing and painting to research and try new projects that required the use of new and recycled media. They collaborated and cooperated to a point, as each student created a unique product for inclusion in the pollinator garden. Six students completed a worthy project, although some were unable to create an artwork that could withstand the weather.

Limitations of Study

The following limitations may affect the generalizability of the findings to other students in art programs. The participants in the present study were in Advanced Placement (AP) art classes. These students may not be representative of all students enrolled in art programs in public high schools. The students' in the study were also unfamiliar with the outdoors having spent little time interacting with the environment. Their art production speaks to the extent to which they really did not know the outdoors. The length of the study was limited to a six-week marking period in the spring. Conducting the study in a school district with standard 10-week marking periods or conducting it in the fall may have resulted in different outcomes. The students had been in the AP art class for more than half of the school year. If the study had been

conducted in the Fall semester, the students may not have had the same level of collaboration because they had not had time to establish the relationships that flourished within the sample. The school that was used in the study has a science program that goes beyond the walls of the school. Planting a pollinator garden is not part of a standard science curriculum. Schools without pollinator gardens might not have other programs that could support research about art creation that fit into such an environment or that allowed students to be in an outdoor environment where such environmental issues can emerge.

Research Contributions and Implications

The purpose of education is to broaden students' worlds, their minds, their experiences, their outlooks, and their dreams for themselves and their communities. Education should teach students to think, rather than telling them what to think. Education should broaden a students' perspective and help build them into aware individuals. This project provided those educational experiences to the students.

The students in the present study were enrolled in an advanced placement art class, with many having plans to pursue art in their post-secondary programs. As part of the project, they were empowered to conduct research, decide on projects, and be creative. The increase in the use of technology for students to learn in isolation (e.g., podcasts, online classes, social networking, etc.) seems to influence the extent to which students are able to integrate what they are learning (e.g., social studies linked with math in economics, art and English literature linked with history to understand how art and literature are related to different eras, etc.). Instead, they learn these subjects in isolation. Education might instead represent a process that helps people learn to think, explore, experiment, take chances, and learn from mistakes.

This project was the students' first opportunity to move out of the educational system that encouraged isolation instead of collaboration and integration. The students had only one constraint on their choice of art projects; it had to be able to withstand the weather in Michigan. This empowerment was new in education and allowed the students to integrate art, science, and the environment in creating unique art projects. The results of this project provided support that students could learn to integrate different concepts into a new idea and produce an artwork that enhanced the environment. This concept is important to education because of the concern that adolescents are becoming more isolated and are unprepared to move into the adult world where interaction, collaboration, creative thinking, and problem solving are necessary for success.

Historically, the students in this study were comfortable in completing their lessons as directed by their teachers. They were not accustomed to having to think about developing a unique project, especially one that required them to become engaged in the outside environment, which was foreign to many of them. They listened to the science teacher, took a walk to the pollinator garden, and then chose a project that could be used to enhance the garden. They initially wanted the researcher/teacher to guide them, but soon learned that they were responsible for choosing their projects and found this challenge empowering.

Artists have long used the environment for inspiration in their artistic endeavors (e.g., Gauguin's tropical island paradises, VanGogh's South of France, Bierstadt's seacoast and mountains, Georgia O'Keefe's flowers or skulls set in the desert, etc.). Although these talented students had artistic plans, they had never used the outdoors as inspiration in their art. The students, through their participation in this program, were motivated to use their exposure to the environment in the form of the pollinator garden to create art using new media and materials that required manipulation and resulted in the creation of dimensional work.

The educational experience is different for urban students than for suburban and rural students. Suburban and rural students, because of the perceived safety of their environment, often engage the environment in their daily lives and their learning. They interact with it more often and inclusively, which often differ from urban students. Regardless of where learning takes place, education/schools have a responsibility to help connect students with the world they inhabit; to understand the relationship between themselves, others, and their community; to broaden their worldview. Though this art project was specific to the high school in the study, the lessons learned are applicable to all of education. The inclusion of the environment, whether urban, suburban, or rural, is necessary to integrate students' worldviews into a larger global worldview.

Further Research

Students in this study began the year isolated and competing with one another. They actively vied for the creative attention for their talent and skills. I noticed during the course of this project, the students became more engaged with one another, shared research discoveries and offered suggestions to each other for construction approaches that might lead to success in their art projects. This study might be conducted in another school with a different population to determine if a similar sense of community and sharing among students develops as it did with the students in the present study.

In the interviews, the students were asked if their participation in this study would have any long-term impact on their art going forward. All of them agreed that to some degree, their involvement in this project would have a long-term effect on their art. Some even spoke of a long-term influence on their approach to their community and the world. Another qualitative study using the same students might be conducted in a study in five years to determine to what

extent and how their participation affected career choices, appreciation of the environment, and their attitudes about art.

The research that students conducted before creating their projects encompassed a number of subject areas: science, engineering, art, and history. Additional research could be conducted to determine if a more open-ended art curriculum that included one or two defined requirements would allow students to incorporate their worldview into education blurring the boundaries between art, English, math, science, and history, interconnecting them and making them relevant to students and their view on themselves, their community, and their world.

Because the students in this study were, for the most part, unfamiliar with the environment and in some cases fearful of it, doing a similar study with students who have been actively engaged with their environment would be interesting to determine what types of art projects they would consider. Students in the present study perceived that the environment was dangerous and only to be interacted with as a place to pass through on the way to another building. They had to overcome their fear of the environment before they could interact, explore, engage, and use it as a source for inspiration. This transition provided time consuming and with only six weeks to explore, research, and produce, I wondered how students with an existing understanding of the environment might react to a similar assignment to create an outdoor art project that could withstand the weather in a northern environment.

Finally, the inclusion of multiple disciplines in the curriculum with minimal constraints on the student may have the potential of eliminating the educational isolation in which students function under the current system. With an environmentally based, cross-curricular educational experience it would be interesting to see if students exposed to that approach to education might have greater success in their post-secondary, work and social lives.

Summary

This project provided a unique opportunity for both the students who participated and myself. Student experiences, as part of a research project, provided them with growth in experiences that included learning about the environment; conducting personal research to create a unique art project; collaborating, critiquing, and encouraging their peers to create and complete their projects; and developing a sense of pride in what they had accomplished. I also grew in understanding the importance of providing educational experiences that required the students to take the lead and develop their projects without my intervention. The sense of empowerment and independence for both the students and myself was powerful and memorable. I was able to link the theories of Reggio Emilia, place-based education, and experience design with the experiences of this project. At the end of the research, most of the students had new environmental experiences that included awareness, advocacy, and product reuse. I learned to trust the students to make informed educational decisions about the kind of art they wanted to pursue, the way they wanted to pursue it, with the hope that they would apply their new-found knowledge to future experiences.

APPENDIX A

WAYNE STATE UNIVERSITY INSTITUTIONAL REVIEW BOARD APPROVAL

WAYNE STATE
UNIVERSITY

IRB Administration Office
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Detroit, Michigan 48201
Phone: (313) 577-1628
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NOTICE OF EXPEDITED APPROVAL

To: Deborah Mills
College of Education

From: Dr. Scott Millis *S. Millis, PhD*
Chairperson, Behavioral Institutional Review Board (B3)

Date: March 05, 2012

RE: IRB #: 01381203E
Protocol Title: A Quantitative Study Integrating Art and Science in the Environment
Funding Source:
Protocol #: 120101051

Expiration Date: March 08, 2013

Risk Level / Category: 45 CFR 46.404 - Research not involving greater than minimal risk.

The above-referenced protocol and items listed below (if applicable) were APPROVED following Expedited Review Category (#7) by the Chairperson/designee for the Wayne State University Institutional Review Board (B3) for the period of 03/05/2012 through 03/08/2013. This approval does not replace any departmental or other approvals that may be required.

- Revised Protocol Summary Form (received in the IRB Office 02/13/2012)
- Protocol (received in the IRB Office 02/13/2012)
- Request for waiver of informed consent (dated 02/10/2012)
- The request for a waiver of the requirement for written documentation of informed consent has been granted for parents according to 45 CFR 46.117(1)(2). Justification for this request has been provided by the PI in the Protocol Summary Form. The waiver satisfies the following criteria: (i) The only record linking the participant and the research would be the consent document, (ii) the principal risk would be potential harm resulting from a breach of confidentiality, (iii) each participant will be asked whether he or she wants documentation linking the participant with the research, and the participant's wishes will govern, (iv) the consent process is appropriate, (v) when used requested by the participant's consent documentation will be appropriate, (vi) the research is not subject to FDA regulations, and (vii) an information sheet disclosing the required and appropriate additional elements of consent disclosure will be provided to participants not requesting documentation of consent.
- Parental Permission/Research Information Sheet (dated 03/04/2012)
- Adolescent Assent Form for Ages 13-17 (dated 02/05/2012)
- Data collection tools: Interview Questions

- Federal regulations require that all research be reviewed at least annually. You may receive a "Deferred Review" approximately 60 days prior to the expiration date; however, it is the Principal Investigator's responsibility to obtain review and continued approval before the expiration date. Data collected during period of lapsed approval is unapproved research and can never be reported or published as research data.
- All changes or amendments to the above referenced protocol require review and approval by the IRB BEFORE implementation.
- Advance Research/Unapproved Research (AR/UR) must be submitted on the appropriate form within the timelines specified in the IRB Administration Office Policy: <http://www.wayne.edu/irb/advance-research.pdf>.

NOTE:

1. If your institution of an impending regulatory site visit, prior consultation with the IRB Administration Office must be conducted immediately.

APPENDIX B

PARENTAL RESEARCH INFORMATION SHEET ADOLESCENT ASSENT FORM

Parental Permission/Research Informed Consent/Information Sheet

Title of Study: **A Qualitative Study Integrating Art and Science in the Environment**

Purpose:

You are being asked to allow your child to be in a research study at their school that is being conducted by Deborah Mills in the Educational Evaluation and Research Department from Wayne State University to study students' involvement in an art project that integrates science and the environment. Your child has been selected because he/she is in the advanced placement studio art program.

Study Procedures:

If you decide to allow your child to take part in the study, your child will be asked to research and create signage for the experimental garden being developed by the science department. Your child will be asked to draw flowers/plants and insects drawn to the flowers on plexiglass. These signs will be placed in the garden to identify the flowers and plants. As part of your child's involvement in the study, he/she will be asked to maintain a journal of his/her experiences, do research on the flowers and plants that will be in the garden, as well as the insects that are attracted to the specific flowers and plants. In addition, your child will be asked to participate in an exit interview at the end of the project. This project will be an assignment for the class regardless of whether your child participates in the journal writing and exit interview. The project will be conducted over a 10-week period to allow sufficient time to research and draw both preliminary and final drawings of the plants/flowers and insects. The journal writing will be continuous throughout the project, with interviews at the conclusion to determine how the students' feel about being involved in research and their perceptions of environmental issues.

Benefits: There may be no direct benefits for your child; however, information from this study may benefit other people now or in the future.

Risks: A breach of confidentiality is a risk in this study. Precautions will be taken to maintain the confidentiality of your child during and after the study. The researcher will be unaware of which students are participating in the study until after grades are submitted for the marking period. While no other risks are anticipated in the study, there may also be risks involved from taking part in this study that are not known to researchers at this time.

Costs: There are no costs to you or your child to participate in this study.

Compensation: You or your child will not be paid for taking part in this study.

Confidentiality: All information collected about your child during the course of this study will be kept confidential to the extent permitted by law. Your child will be identified in the research

records by a code name or number. Information that identifies your child personally will not be released without your written permission. However, the Institutional Review Board (IRB) at Wayne State University or federal agencies with appropriate regulatory oversight (Office for Human Research Protections [OHRP], Office of Civil Rights [OCR], etc.), may review your child's records.

Voluntary Participation /Withdrawal: Your child's participation in this study is voluntary. You may decide that your child can take part in this study and then change your mind. You are free to withdraw your child at any time. Your decision about enrolling your child in the study will not change any present or future relationships with Wayne State University or its affiliates, your child's school, your child's teacher, your child's grades or other services you or your child are entitled to receive.

Questions:

If you have any questions about this study now or in the future, you may contact Dr. Karen Tonso or one of her research team members at the following phone number (313) 577-1764. If you have questions or concerns about your rights as a research participant, the Chair of the Institutional Review Board can be contacted at (313) 577-1628. If you are unable to contact the research staff, or if you want to talk to someone other than the research staff, you may also call (313) 577-1628 to ask questions or voice concerns or complaints.

Participation:

If you do not contact the principal investigator (PI) within five days of receipt of this letter, to state that you do not give permission for your child to be enrolled in the research trial, your child will be enrolled into the research. You may contact the Dr. Tonso at (313) 577-1764, by email at ag7246@wayne.edu, or by returning the tear-off sheet to Dr. Tonso in the enclosed pre-addressed, postage paid envelope.

Optional Tear Off

If you do not wish to have your child participant in the study, you may fill out the form and return it to Dr. Tonso in the enclosed pre-addressed postage-paid envelope.

I do not allow my child _____ to participate in this research study.	
Name	

Printed Name of Parent	
_____	_____
Signature of Parent	Date

Adolescent Assent Form

(ages 13-17)

Title: A Qualitative Study Integrating Art and Science in the Environment

Study Investigator: Mrs. Deborah Mills

Why am I here?

This is a research study. Only people who choose to take part are included in research studies. You are being asked to take part in this study because you are in the advanced placement studio arts course. Please take time to make your decision. Talk to your family about it and be sure to ask questions about anything you don't understand.

Why are they doing this study?

This study is being done to find out how participating in an art project that involves science and the environment promotes ecological awareness.

What will happen to me?

You will be asked to draw flowers/plants and insects drawn to the flowers on plexiglass. These signs will be placed in the garden to identify the flowers and plants. As part of your involvement in the study, you will be asked to maintain a journal of your experiences, do research on the flowers and plants that will be in the garden, as well as the insects that are attracted to the specific flowers and plants. In addition, you will be asked to participate in an exit interview at the end of the project. This project will be an assignment for the class regardless of whether you participate in the journal writing and exit interview. The project will be conducted over a 10-week period to allow sufficient time to research and draw both preliminary and final drawings of the plants/flowers and insects. The journal writing will be continuous throughout the project, with interviews at the conclusion to determine how you feel about being involved in research and your perceptions of environmental issues.

How long will I be in the study?

You will be in the study for a 10-week period, during your regular class periods. At the end of the project, you will be asked to participate in an interview that should take no more than 30 minutes. The interviews will be scheduled at your convenience.

Will the study help me?

“You may not benefit directly from being in this study; however information from this study may help other people in the future.”

Will anything bad happen to me?

A breach of confidentiality is a possible risk in this study. Precautions will be taken to maintain your confidentiality during and after the study. Mrs. Mills will not be aware of which students are participating in the study until after grades are submitted. While no other risks are anticipated in the art project, there may also be other risks that are not known to the researcher at this time.

Do my parents or guardians know about this? (If applicable)

This study information has been given to your parents/guardian. You can talk this over with them before you decide.

What about confidentiality?

Every reasonable effort will be made to keep your records and/or your information confidential, however we may have to let some people look at your study records.

What if I have any questions?

For questions about the study please call Mrs. Deborah Mills . If you have questions or concerns about your rights as a research participant, the Chair of the Institutional Review Board can be contacted at (313) 577-1628.

Do I have to be in the study?

You don't have to be in this study if you don't want to or you can stop being in the study at any time. Please discuss your decision with your parents and researcher. No one will be angry if you decide to stop being in the study.

AGREEMENT TO BE IN THE STUDY

Your signature below means that you have read the above information about the study and have had a chance to ask questions to help you understand what you will do in this study. Your signature also means that you have been told that you can change your mind later and withdraw if you want to. By signing this assent form you are not giving up any of your legal rights. You will be given a copy of this form.

Signature of Participant (13 yrs & older)

Date

Printed name of Participant (13 yrs & older)

**Signature of Witness (When applicable)

Date

Printed Name of Witness

Signature of Person who explained this form

Date

Printed Name of Person who explained form

** Use when participant has had consent form read to them (i.e., illiterate, legally blind, translated into foreign language).

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ABSTRACT**A QUALITATIVE STUDY:
INTEGRATING ART AND SCIENCE IN THE ENVIRONMENT**

by

DEBORAH N. MILLS

May 2013

Advisor: Dr. Karen Tonso
Degree: Doctor of Philosophy
Major: Educational Evaluation and Research

The study was used to develop an understanding of the nature of a creative learning experience that incorporated the foundational elements of Reggio Emilia, place-based education, and experience design. The study took place in an urban high school with eight students in an advanced placement art class. The qualitative research project revolved around the pollinator garden that the science teacher planted in the year prior to the study and the garden that was planted in the spring. Students were asked to create an art project that could withstand the Michigan climate. The science teacher lectured on elements of the pollinator garden, with the researcher showing examples of other artist's works found in natural settings. The students were asked to research, develop, and create a unique piece for the garden. The work was to be completed in the 6-week card marking. Qualitative data for the study were collected through the researchers' field notes, personal journal, student journals, interviews, and students' finished projects. After six weeks, the students completed their projects and six of the eight projects were hung in the garden.

Participating in the study was the first time in their education that the students had opportunities to be autonomous in choosing their projects, deciding on the appropriate media,

and completing the artwork on a specific schedule. During the study, the students became collegial and collaborative, offering suggestions and critiquing each other's work. The students grew educationally in a number of ways. They learned to work independently in planning and completing their art projects. They saw the link between science and art and they moved from being competitive to being cooperative. The students became engage with the environment as well as incorporating elements of the environment in their artwork. Further research is needed to determine if students in high school art classes could link the environment, science, and art to build a more comprehensive, inclusive, and cross curricular learning experience by completing similar projects to enhance their schools environment and develop an understanding of the interconnectedness between education and its practical applications.

AUTOBIOGRAPHICAL STATEMENT**Deborah N. Mills**

Education	<p>Wayne State University, Detroit, MI Doctor of Philosophy Major: Educational Research and Evaluation</p> <p>Education Specialist Degree Educational Administration</p> <p>Wayne State University, Detroit MI Certificate: Art Education</p> <p>Lawrence Institute of Technology, Southfield, MI Certificate: Interior Architecture</p> <p>Eastern Michigan University, Ypsilanti, MI Masters of Fine Art Major: Sculpture</p> <p>Wayne State University, Detroit MI Bachelor of Fine Art Major: Art</p>
Licensure	Professional Educational Certificate
Professional Experiences	<p>Southfield Public Schools, Southfield, MI Southfield Lathrup High School, Positions: Department Chairperson, CAS Coordinator, IB Studio Art, AP Studio Art, Design and Media, Animation, Ceramics, and Jewelry Teacher. Fine and Performing Arts Academy Coordinator. Play Producer and Social Committee Chairperson Generation of Promise Coordinator</p> <p>Our Lady of Refuge School K-8, Keego Harbor, MI Position: Art Teacher K-8</p>
Professional Memberships	<p>National Education Association Michigan Education Association Member Detroit Institute of Art Michigan Art Education Association National Art Education Association</p>