

# **A Community Partnership to Facilitate Urban Elementary Students' Access to the Outdoors**

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## **Abstract**

Today's children spend less and less time in the outdoors, leading Richard Louv in 2008 to coin the term "nature deficit disorder." Louv pointed out that experiences with nature are essential to a child's physical and emotional development and that the lack of these types of experiences has led to an increase in child obesity, attention disorders, and depression. Poor urban students in particular have little access to experiences with nature, and outdoor classrooms are increasingly being used to foster a sense of community in schools and to provide students with learning opportunities related to nature. This field study describes a partnership formed between a local university, a school district, and a community organization in order to develop and implement outdoor classrooms and curriculum in seven local elementary schools. Results based on teacher reflections on using the outdoors for educational purposes, collected before and after the implementation of the program, indicated a shift in teachers' perceptions about the value of the outdoors for instructional purposes which translated into a greater number of learning experiences for their students and helped foster a sense of community in their schools.

Key Words: outdoor classrooms, environmental education, community organizations, university partnerships, urban students, school as community, nature

## **Introduction**

Many children today grow up having few experiences in the outdoors or simply playing outside (Clever, 2007). Indeed, according to a 2009 study

conducted by the Nielsen Company, on average, children aged 2–5 spend more than 32 hours a week watching TV, while those aged 6–11 spend about 28 hours per week watching TV (McDonough, 2009). Louv (2008) contended that children's lack of experiences with nature, which he calls "nature deficit disorder," is connected to an increase in child obesity, attention disorders, and depression. Louv pointed out experiences with nature are essential to a child's physical and emotional development. Similarly, Cleaver (2007) maintained, "children who spend time outdoors are healthier, happier, and smarter" (p. 20).

Despite the evidence pointing to the importance of outdoor and environmental education to the educational, physical, and emotional development of youth, most states continue to lack standards for teacher certification related to environmental education and/or environmental studies. In elementary or middle schools, environmental education often occurs through curriculum supplements and/or student activities supported by grants for teacher training (Engels & Jacobson, 2007; Kenney, Militana, & Donohue, 2003). Conversely, in secondary schools environmental education is often viewed as a less rigorous science, is rarely offered, and when available is used as an elective to substitute for other "harder" sciences such as chemistry or physics (Hart, 2010).

Given this lack of focus on environmental education, most teachers finish their teacher preparation programs unaware of the ways in which environmental or outdoor education can be used as a context to teach other areas of the curriculum such as science, language arts, mathematics, and social studies (Johnston, 2007, 2009; Parlo & Butler, 2007). These teachers have difficulty realizing the connection between environmental education and the standards they have to cover in the content area(s) they teach (Parlo & Butler, 2007). In fact, teachers frequently mention the pressure related to content standards and/or standardized tests as a reason for not including topics related to environmental education in their lessons (Johnston, 2009; Parlo & Butler, 2007).

### **Environmental Education and Student Outcomes**

Although environmental education is often ignored in schools, researchers have found a correlation between environmental education and student outcomes, including achievement, motivation, and environmental literacy (Bartosh, Tudor, Ferguson, & Taylor, 2006; Engels & Jacobson, 2007; Stepath, 2005). In a 2006 study examining the impact of environmental education programs on student achievement in math, reading, and writing, Bartosh and colleagues found that schools using environmental education programs performed better on standardized tests than did those using traditional curriculum (Bartosh et al., 2006). Others found significant short-term and long-term effects of environmental education programs on participants' science content

knowledge, connections with nature, environmental stewardship, and interest in learning and discovery (Engels & Jacobson, 2007; Farmer, Knapp, & Benton, 2007; Manzo, 2008; Stern, Powell, & Ardoin, 2008). According to Eckert, Goldman, and Wenger (1997), learning activities in which a student collaborates with other students and adults to examine local problems help build community and lead to greater learning. Battistich and Hom (1997) point out that when schools function as communities they are characterized by “caring and supportive interpersonal relationships” (p. 1997). Furthermore, students who experience schools as communities have fewer behavior problems, attend school more often, and have more positive attitudes about school (Battistich & Hom, 1997; Manzo, 2008; Mayes, 2010; Reeves & Emeagwali, 2010). According to Reeves and Emeagwali (2010), children who are disengaged and alienated from school find a sense of purpose when working with others in outdoor projects such as building and tending gardens. These children develop a sense of belonging towards their school because of their meaningful participation in a community of practice (Eckert et al., 1997; Supovitz, 2002).

### **“No Child Left Inside” Legislation**

Legislation related to environmental education has not been passed in the U.S. in the past 25 years. However, increasing environmental awareness due to discussions of global warming and other environmental issues, as well as reports about children’s lack of experiences with nature and health issues related to obesity and diabetes, have led some in the government to introduce new legislation related to environmental education. In 2007 Congressman J. Sarbanes of Maryland and Senator J. Reed of Rhode Island introduced legislation known as “No Child Left Inside,” which was approved in June 2008 by the committee on Education and Labor. In September 2008 the House of Representatives approved the No Child Left Inside Act, H.R. 3036, and the Senate and House versions of the act were introduced in 2009 on Earth Day. If passed, the legislation will lead to the authorization of new funds for states to provide high-quality, environmental education and outdoor learning activities both at school and in non-formal environmental education centers. The legislation also includes funds for teacher professional development and the creation of state environmental literacy plans. Therefore, if the No Child Left Inside bill is passed and funds appropriated, many more children in the future will have access to environmental and outdoor education.

Meanwhile, initiatives such as the one described here bring the community together to help offset the lack of educational opportunities related to environmental and outdoor education in some of the most indigent schools. This program, supported by a grant from the Michigan Department of Education,

led to a collaborative partnership between a local university, a school district, and a community organization in their efforts to develop and implement outdoor classrooms and curriculum in seven local elementary schools.

## Method

### Background on Partnership

The Greening of Detroit is a 501(c)(3) not for profit organization, established in 1989 with its main goal to reforest the city of Detroit (see <http://greeningofdetroit.com/>). Since then and through partnerships between schools, other community organizations, and businesses, the organization has been involved in the development of community gardens, outdoor classrooms, and neighborhood and park tree planting.

In 2009, a collaborative partnership was formed between a local university, the Greening of Detroit, and the local school district, supported by a grant from the Michigan Department of Education. The main goals of the project were to: (1) help develop teacher efficacy in the use of environmental and outdoor curricula; (2) foster the development of a sense of community in participating schools by involving students, parents, teachers, and others in the design, building, and upkeep of the outdoor classrooms facilitated by the Greening of Detroit; and (3) foster the development of a community of practice among the teachers by involving them in curriculum development that could be implemented in their schools' yards and the surrounding community.

### Program Participants

Sixteen teachers from seven elementary schools participated in the program. All the teachers except one were female, and 63% of them were African American. The great majority of the teachers (81%) did not possess a major or minor in science.

### Program Implementation

The project was implemented with the concept of collaborative practice in mind by providing teachers, students, and parents opportunities for meaningful participation in the school community (Eckert et al., 1997; Lave & Wenger, 1998; Supovitz, 2002 ). According to Eckert and colleagues (1997), in a community of practice people share a sense of purpose and come together around common endeavors. In the program described here, members of the school community gathered together to design and build outdoor classrooms to increase their children's access to outdoor education.

The program began in the summer of 2009 when the teachers joined university faculty to participate in a week-long series of workshops related to outdoor and environmental education support curricula: Project Wild/Wild Aquatic; and three units of the Michigan Environmental Education Curriculum Support (MEECS) – Ecosystems and Biodiversity, Energy, and Land Use. All the teachers received free copies of the Project Wild books and all the instructional materials related to each MEECS unit. Working in collaborative groups, the teachers took turns leading other teachers through the activities in these curriculum resources.

In the fall, the Greening of Detroit visited each school to meet with students, teachers, and administrators to discuss the site for the outdoor classroom. Once the site was chosen, the students participated in a “Dream and Design” series of activities that included deciding the location and shape of the garden(s), as well as the type of garden(s) to be planted (e.g., butterfly, vegetable, perennial, or combination of any of these). For example, one school chose to build a butterfly and vegetable garden in the shape of the state of Michigan.

Early the next spring, the Greening of Detroit brought to each school all the materials needed to build the outdoor classrooms (wood for the plant boxes, soil, mulch, and plants). The school community (teachers, students, and parent volunteers) gathered together and collaborated in the building of the boxes, carrying the soil, planting and watering the plants, and mulching. An observation station was included in each garden in the form of a box attached to a post, containing a journal and a pencil, for students to record their observations related to weather, animals found in the garden, plant growth, and so on. Partnerships with community businesses were established for the watering of the plants during summer recess.

### **Curriculum Development**

During the summer of 2010, a group of teachers spent a week together in a community of practice (Lave & Wenger, 1998; Supovitz, 2002) developing lessons and activities across the content areas that could be implemented using the outdoor classrooms and schoolyard. Some of the lessons were related to weather, while others were related to wildlife, habitats, mathematics, and social studies. Language arts were integrated in all the lessons as students read books, made observations, and kept journals. The lessons and activities were organized by topic and grade level and distributed to all the teachers who had participated in the program. In addition, each school received instructional materials to support these lessons, such as outdoor weather stations and bird and tree identification field guides.

## Data Collection and Analysis

The evaluation of the program included quantitative and qualitative approaches in data collection and analysis. Before and after the implementation of the program teachers rated their level of preparedness to teach concepts related to the areas in which they received professional development, as well as some aspects of their pedagogical practice, using a four-point scale from 1 (not adequately prepared) to 4 (very well prepared). Descriptive and inferential statistics were used to find statistically significant differences between their “before” and “after” program ratings with statistical significance determined at  $p < 0.05$ .

To determine the impact of the program on teachers’ practice, participants used electronic portfolios in which they recorded their reflections related to the usefulness of the activities in which they participated, as well as their use of the outdoors and schoolyard for instructional activities before and after participating in the program. These qualitative data were analyzed using techniques of naturalistic inquiry (Lincoln & Guba, 1985; Miles & Huberman, 1994). As data were read several times, individual segments of data were coded and similar codes grouped into themes.

## Results

Pre- and post-program comparisons indicated the program had a significant impact on participating teachers’ perceptions of their level of preparedness to teach concepts related to life and environmental science as well as on their use of the outdoor classrooms and schoolyard for instructional purposes.

### Program Impact on Participants’ Science Content Knowledge and Pedagogical Practice

As indicated in Table 1 below, there was a significant difference in teachers’ perceptions of their knowledge before and after participating in the program in two major areas related to environmental science: organization of living things, and ecosystems. After participating in the program, teachers also felt better prepared to facilitate problem solving among their students, help their students make connections within and between science topics, make connections from science to real-world situations, and engage their students in hands-on/project-based activities.

Table 1. Program Impact on Teachers' Perception of Science Knowledge and Pedagogical Practice: Pre- and Post-Treatment

Science Topic	Pre-Treatment <i>M</i>	Post-Treatment <i>M</i>	<i>M</i> Difference
Organization of living things	2.11	2.56	0.45*
Ecosystems	2.63	3.30	0.67*
Involve students in problem-solving	3.21	3.61	0.40*
Help students make connections within and between science topics	2.93	3.37	0.44*
Help students make connections from science to real world situations	3.19	3.52	0.33*
Engage students in hands-on/project-based activities	3.07	3.50	0.43*

\* $p < .05$

Qualitative data support the results from the quantitative analysis. When commenting on the workshops related to Project Wild and MEECS, one of the teachers wrote: “I learned a lot about energy I did not know before,” while another wrote, “I feel stronger and more confident in presenting and demonstrating science to my students in a more constructive and fun way.” Another teacher commented, “These workshops filled a hole in the amount of information I had. I feel a lot more comfortable and prepared when working with the students.”

When reflecting on her teaching style before and after participating in the program, one of the teachers wrote in her portfolio:

Before participating in this program my attitude toward teaching science—and science in general—was one of fear and mistrust. Fear of what I didn't know about the subject and mistrust of my own ability to teach it. After my participation in this program I found that my comfort with the subject matter has increased and my fears have abated. I no longer look with terror on my science curriculum. I can enter my classroom feeling secure and confident—secure in the knowledge that I know and confident that I will be successful at it. (Participant E 3)

Another teacher described the following change in her teaching style:

Before this program, I taught in front of my class with students sitting in rows and being taught from the textbook. They would read the chapter, copy the vocabulary words, write the definitions, and answer the checkpoint questions and end of chapter questions. During the program, I learned lots of fun activities that I implemented in my classroom.

Students began liking to come to science class and doing hands-on/minds-on activities. (Participant C 4)

Another teacher shared the following reflection:

I have always believed that if students are having fun, they will learn more. However, I have succumbed to the “old ways” of keeping students quiet and busy, because it’s expected by most principals and co-workers. This program has encouraged me to return to my beliefs that school can and should be fun, hands-on, and project oriented. The children respond with great enthusiasm and excitement. They are more involved, and I know they are learning by how they interact with purpose and intelligence. (Participant B 1)

Further analysis of the data from teacher reflections recorded in their electronic portfolios led to the identification of four major themes: (1) usefulness of the curriculum resources they received; (2) their immediate impact on their practice at the classroom level; (3) a sense of community that evolved in schools; and (4) a shift in perception about the use of the schoolyard as an educational setting.

### **Usefulness of Curriculum Resources**

One of the most useful aspects of the program, according to the participants, was the amount of ideas, activities, and curriculum support materials that they received and the fact that most of these materials were “ready to use,” or as one of them put it, “easy, friendly, hands-on activities.” This was particularly important since the great majority of the teachers did not have a science major or minor. As pointed out by one of the participants, “this workshop should be available to all teachers. I will use these activities next school year. The kids will love them, and they can’t help learning as they do them.” Another teacher commented, “I received a lot of information to use in my class, and I cannot wait to do some of the activities.” Another teacher felt the “activities will keep my students engaged,” while another couldn’t “wait to do these lessons!” Some teachers also commented on the usefulness of such activities in helping them to accomplish certain goals for their school, as indicated in the following comment: “I will use these activities as part of our plan for becoming a Michigan green school.”

The fact that the curriculum materials they had received were “ready-to-use” and contained all the supplies needed to implement the activities had immediate impacts on teacher practice, as illustrated in the comments below:

Having these resources at my fingertips and the confidence to use them along with a sense of their purpose was an excellent start. By the time I

was dissecting an apple to help my students understand the amount of fresh water on our Earth, we were all hooked! (Participant F 2)

Before this program, the resources I used were primarily from the Harcourt Science Unit provided to me by the district. This year, I used a lot of resources from Project Wild and Project Wild Aquatic because they fit into the fourth grade unit on “Animal Adaptations.” (Participant B 2)

Before this program, I was not at all familiar with the resources available through Project Wild, Wild Aquatic, or MEECS. During and after this program, I was very excited to share some of these great activities with my students. One of the very first activities we did was “wild versus domesticated.” (Participant G 3)

I wasn't familiar with Project Wild/Wild Aquatics K–12 Curriculum and Activity Guide, MEECS. All of these resources have become an integral base for me to further use in my teaching practice. (Participant D 1)

### **Outdoor Classrooms and Sense of Community**

As previously indicated, members of the school community collaborated with the Greening of Detroit to design and implement outdoor classrooms that could be used for outdoor and environmental education. The outdoor classrooms were composed of raised garden beds containing a variety of different plants including vegetables such as tomato, zucchini, peppers, cucumbers, and varieties of cabbage. These in turn led to lessons on nutrition as students picked the various fruits and vegetables to eat in collaboration with the school cafeteria. Some of the containers were used to plant a butterfly garden to attract butterflies. As illustrated in the quotes below, the outdoor classrooms helped strengthen the sense of community in the schools:

We are a K-8 school, and each grade level created and built their own garden. Our goal was to have each grade level take ownership of their garden. The older students did the heavy building and lifting, and the younger students helped plant the gardens. The gardens were beautiful when they were completed; they stayed intact for about a week. Then some vandals came in and ripped out the plants. This turned out to be a great learning experience for the students. They were very angry that their work had been destroyed, and they made it their goal to fix the garden and pass the word around that “we want to keep our school beautiful.” The gardens are now put back together, and just today the students in my class saw a bunny in the garden. They were able to write about it in the journals. (Participant F 3)

After we met with the Greening of Detroit to decide the type of garden we were going to plant, the students decided on a butterfly garden. After finishing planting the garden, I brought my students back to the site to observe the finished project. The students were thrilled to see the finished project, and I heard a lot of conversation about what each one of them had done to make the project a success and what flowers they had worked together to plant. Now we have been observing many of the flowers, waiting for them to bloom. (Participant G 1)

Last year, I sought to teach students about plants in a hands-on way. However, I had never heard of the Greening of Detroit. The plants often went home only to never be transplanted and eventually died in their containers. This year, it's thrilling to see that the children will be actively participating in this endeavor. This is the first year that I had a student come in with a bird's nest that she found because she wanted to share it with her classmates. (Participant G 2)

### **The Schoolyard as an Extension of the Classroom**

Results also indicated a shift in teachers' perceptions about the value of the school grounds for instructional purposes, not only the outdoor classrooms that had been built, but the schoolyard as a whole. This shift in turn translated into a greater number of learning experiences for students. The following excerpts illustrate these findings:

Since participating in the program, I have attempted to do more with the students using the outdoors. Some of the activities included comparing temperatures on multiple surfaces on the playground; comparing and contrasting ecosystems in different locations around the school using string circles; and measuring and collecting, identifying and sorting litter found near the school. (Participant D 3)

After attending the workshops at the university, I taught an outdoor lesson about snowflakes to the first grade in February. We had been studying weather, and we discussed different types of snowflakes. One Friday it started snowing really hard, so I took them outside with magnifying glasses in hand to examine snowflakes. It was a huge success! They could easily see six branches on each snowflake. They were squealing with delight. In March, April, and May I taught outdoor lessons to the first and second grades. The first grade unit was Seasons, and the second grade unit was Plants. In April, I taught a bird observation lesson to the third graders; in May, I repeated it with the first and second grades. (Participant F 2)

In January, I took my 25 fourth graders outside for an outdoor education class. I was really enlightened by some of the things the children noticed. They noticed that not all trees lose their leaves, they saw a couple of squirrels' nests way up near the top of some larger trees. We stayed outside for about 40 minutes. Once indoors, I had the children write down what they observed outside while their thoughts were still fresh in their minds. (Participant C 2)

Some teachers were also helping their students make connections between their outdoor classroom and other educational settings in the community as illustrated in the comment below:

This past week, we went to the Detroit Zoo where we visited their butterfly garden. Students were able to compare the zoo's garden to the one that we had planted at our school. Students identified plants at the zoo that we had planted in our garden. We researched the different perennials that we planted. The students are learning why butterflies are attracted to these plants and what butterflies are native to Michigan. Just recently, the students have started to observe various butterflies in our garden. We observe which flowers or plants they seem to like best. (Participant B 1)

### **Discussion**

In this program, students of various grade levels, their teachers, and parents formed a community around a common goal: to build outdoor classrooms that could serve as a context for student learning. Their efforts were facilitated by a community organization which had a long history in their city and by collaboration with the local university. These various stakeholders came together at different points in the life of the program to ensure its success. Researchers contend that when schools develop and cultivate relationships with other organizations and institutions in the community, their circle of connections widens, leading to future collaborations (Hands, 2005; Manzo, 2008; Mayes, 2010). Similarly, involving parents in the school community fosters relationships between the school and families and widens teachers' understanding of the students they teach (Kyle, McIntyre, Miller, & Moore, 2005; Souto-Manning & Lee, 2005).

While the school community collaborated with the Greening of Detroit in the development and implementation of the outdoor classrooms, the local university provided the participating teachers with professional development in environmental education curricula that could be integrated with the outdoor classrooms. This aspect of the program helped increase teachers' knowledge of

topics related to environmental science and their confidence in the use of the schoolyard as a context for teaching and learning. Like the teachers in Tal's (2010) study, our participants had little knowledge about outdoor and environmental education. Parlo and Butler (2007) suggested teacher professional development should focus on subject matter knowledge so that teachers become aware that certain science concepts can be covered using topics related to environmental education. In the program described here, the science content related to each of the activities the teachers received was covered as teachers immersed themselves in these activities as students. This approach helped to build community among the participants and developed their confidence in their ability to use these activities with their own students. The combination of professional development on content related to environmental education topics, ready-to-use activities, and supporting instructional materials clearly contributed to a sense of empowerment among our participants.

The use of the schoolyard as an instructional resource to teach concepts across the curriculum is receiving increasing attention (Alexander, 1991; Billmore, Brooke, Booth, Funnell, & Bubb, 1999). The results of this study indicate that many of our participants were beginning to realize the potential of the school grounds as an educational setting and source of authentic science experiences. The schoolyard was no longer seen as a place for recess; instead, it had become an extension of the classroom. Some of our participants also began realizing that academic topics can be linked to the local environment, which in turn makes the material more relevant and helps students make real-world connections (Parlo & Butler, 2007). Johnston (2007, 2009) maintained that teachers and schools need to realize that many of the subject areas can be integrated into topics related to the environment and that the environment should be viewed as an integrated context for learning. For example, in language arts students can read and write about environmental topics and issues, while in mathematics they might examine environmental data or simply measure objects outside and use the measurements to determine distances between objects or the area and volume of such objects. Children become more motivated to write about something they are seeing and will better remember the formulas to determine area and volume when they practice such skills in the context of determining how much wood or soil they will need to build plant beds for their school gardens. These learning experiences provide students with opportunities for "meaningful participation" (Eckert et al., 1997, p. 3) and create community by fostering a sense of shared purpose (Supovitz, 2002). According to Manzo (2008), teachers and schools need to shift from seeing environmental education as something related only to a field trip to a local park or something for special projects, viewing instead the schoolyard as an integral extension of the

classroom. According to Johnston, “outdoor learning should be seen as fundamentally important for all education” (2009, p. 6); while Orr (1992) argued that all education is environmental education.

Research indicates that when schools use the environment as an integrating theme across the curriculum, their student test scores in the traditional subject areas such as reading, writing, mathematics, and science go up (Bartosh et al., 2006; Cleaver, 2007; Engels & Jacobson, 2007; Stepath, 2005). Furthermore, students who learn core subjects within the context of the outdoors are more motivated, have fewer discipline problems, and develop a sense of belonging and ownership in their school (Manzo, 2008; Mayes, 2007; Reeves & Emeagwali, 2010). Eckert and colleagues (1997) stressed that “schools need to provide the opportunity for students to form communities of practice around subject matter” (p. 3).

## Implications

The National Science Standards acknowledge the importance of using the environment outside the school as a source of scientific inquiry. As stated in Teaching Standard D, the area outside the school can be used “...as a living laboratory....Whether the school is located in a densely populated urban area, a sprawling suburb, a small town, or a rural area, the environment can and should be used as a resource for science study” (National Research Council, 1996, p. 45). In large urban areas such as Detroit, many children have few experiences with nature. Yet, the schoolyard as well as the surrounding community can be a source of scientific inquiry all year long to students in all grade levels and can also provide opportunities for community involvement. Students can study the changes that the seasons bring, plant adaptation, habitats, weather conditions, and many other topics. These types of learning experiences do not require major allocation of resources and lead to benefits for the whole community (Haines, 2006). They mainly require a shift in the perception of school administrators and teachers about the meaning of “classroom.” In a city such as Detroit, with many vacant lots, the school—in collaboration with parents and other members of the community—can develop meaningful projects that result in student learning and lead to community-building (Eckert et al., 1997; Lave & Wenger, 1998; Supovitz, 2002). Johnston (2009) pointed out that creating a sense of community is an essential aspect of being eco-friendly and of living in a sustainable manner.

Environmental literacy needs to become an integral part of our educational curriculum as we face current and future environmental issues. Cassell and Nelson (2010) caution that,

Humanity is facing, and must deal with, enormous ecological and social problems and challenges. This situation has created an urgent and compelling need centered on how the future citizenry of the industrialized West will be prepared relative to addressing and dealing with these problems and challenges. (p. 179)

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