

CITY SCHOOLS AND NATURAL AREAS: A CASE STUDY OF TEACHERS USING NATURAL AREAS ON SCHOOL GROUNDS FOR ELEMENTARY SCIENCE EDUCATION



5/2004

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Prepared for Urban Affairs Center
5/2004

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Table of Contents

Table of Contents.....	1
Executive Summary.....	2
Introduction.....	3
Literature Review.....	4
Research Design	8
Findings.....	9
Data Analysis And Findings.....	9
Barriers and Roadblocks in the Way of Schoolyard Studies.....	10
Institutional, Systematic and Administrative Pressures Discourage Teachers from Taking Students on Schoolyard Field Trips.....	14
Data Analysis Summary.....	24
Discussion	24
Implications for Success in Schoolyard Programs.....	26
Policy Implications and Recommendations.....	28
Summary.....	29
Resources.....	30

Executive Summary

Although the establishment of natural areas or land labs on or adjacent to elementary school properties has become popular in recent years, research suggests that in most cases they actually see limited use and have a limited impact on student learning. This case study research examines a collaborative attempt to provide natural area laboratories adjacent to elementary schools in one Midwestern city. Through personal interviews with administrators, program directors, and teachers, the factors related to the successes and failures of an environmental education program are examined.

Results of this study suggest that although participants agree that there are clear and significant educational opportunities for students, the viability of urban school nature initiatives depends on whether or not schools can address three related factors, if:

- A cadre of enthusiastic teachers are confident and knowledgeable enough to use the natural area regularly,
- There is sustained financial and educational support, and
- The school has relatively high teacher and administrative stability.

Introduction

It is inconceivable to me that an ethical relation to land can exist without love, respect, and admiration for land, and a high regard for its value.

Aldo Leopold

Field experiences potentially provide close contact with the natural world, stimulate curiosity, and provide clear opportunities for scientific inquiry (NRC 1996). Because of this, they can be a valuable component of the K12 science education curriculum, According to the National Standards for Science Education, “The physical environment around school can be used as a living laboratory for the study of natural phenomena... the environment can and should be used as a resource for science study” (NRC, p. 45). The hope is that children, going outside and experiencing nature first hand, can discover the wonders of nature and the environment. In addition, if they are given carefully orchestrated opportunities to inquire about nature in scientific ways, they also will learn about science as a field of study. In large metropolitan areas, it is often difficult for children to experience anything resembling naturally wild fields, woodlands, or wetlands. However, schoolyard natural areas laid fallow and set aside as schoolyard laboratories can help provide in-nature experiences for urban children.

In the Midwestern US, the State of Ohio is also deeply invested in such schoolyard laboratories. In a handbook published in 1994, *Habitats for Learning: Ohio takes a new look at school land labs* booklet (Landis, 1994), 163 public schools are listed as having schoolyard laboratories on or adjacent to school property. The Ohio Department of Natural Resources (ODNR) division of Wildlife supports these school initiatives through teacher training, support and curricular resources. Although many teachers and environmental educators call these natural areas “land labs,” ODNR prefers to call them “Habitats for Learning” because the word habitat implies an integrated view of living in and learning from nature. They claim that students learn better about the environment outside than inside the traditional classroom.

This article is about research that examines adult participant perspectives on a particular, exceptional urban initiative to develop, support, and institutionalize Habitats for Learning (Land Labs). (For reasons of confidentiality, the city will be referred to Ohio City, a pseudonym. All informant and school names are pseudonyms). It is unique because the City Department of Parks Recreation and Forestry, funded by city income tax of a major metropolitan area dedicated some of their property for public school education in collaboration with urban public schools. This contrasts with city metroparks which are funded by property taxes and are usually located in the outskirts of the city or in rural areas. This means that urban children were given educative experiences outside their school in a constructed natural areas.

PARK-IT! (Elementary Land Laboratories in Ohio City Parks) is a 6 year- old initiative of the City Department of Parks Recreation and Forestry in collaboration with a large urban school district funded by The Ohio Environmental Protection Agency

(OEPA), Ohio Environmental Education Fund (OEEF). Five of the urban elementary schools (K-6) which have city parks property adjacent to them agreed to participate in this program. The director of the program used several criteria in the selection of participant schools. First, the school must be adjacent to city parks property of 5 acres or more. At least one acre of the parks property must be fallow or mowed lawn and not dedicated to sports fields or other purposes. Five city schools satisfied these requirements and were invited to participate. For our purposes, we will call these schools City 1-5. During the first year of the program, the City Department of Parks Recreation and Forestry staff and facilities to strongly support the individual schools.

One acre of land was set aside, a split-rail fence was placed around the area, and Parks staff helped teachers and their students plant native trees such as pin oaks, hawthorn, and ash. Within the grant period, many amazing changes happened in the one-acre plots as grass grew and animals began to invade. Because the grant-funded time period was limited to two years, the plan was to help the schools become self sufficient by gradually weaning them of their dependence on direct support. During the first year, there was consistent support from City Department of Parks Recreation and Forestry in the form of on-site teacher in-service and consultation. The program director personally led one workshop at each school per year. Teachers were also invited to participate in an introductory workshop session at the city parks headquarters. About 20 of the most interested teachers attended these workshops.

During the first two years, there were mixed results among the five schools. Teachers and other community people who were leaders in their schools in the development, use, and institutionalization of this program were interviewed. Administrators served as informants and added their perspectives. Teachers who rarely used their school natural area for instruction were also interviewed. This research can inform similar initiatives for student learning from nature and learning in natural areas in urban settings and help pave the way for educative use of natural sites in urban areas.

Literature Review

Research about Taking School Children Outside

Although the schoolyard natural laboratory is hardly a new idea, it seems to be gaining a higher profile in popular environmental literature. For example, in a recent issue of Audubon magazine, the cover article, "The Sky's the Limit" the authors state that "Students throughout Latin America are spilling out of classrooms and into schoolyards—and turning small observations into much larger life lessons" (Markels, 2001 November-December). Teachers, through "schoolyard ecology" use the environment around the school as an extension of the classroom. The Audubon Society's Latin America and Caribbean Program describes this initiative as a "flagship education project" (p. 44). According to the author, as students learn school subjects in integrated ways, they develop attitudes and perspectives that have significant long-term implications. Markels quotes Peter Feinsinger, a tropical ecologist given credit for

developing the schoolyard-ecology concept, that “many of us think that this is the best long-term route toward conservation”(p. 42). The authors explain that similar schoolyard-ecology programs are popular, active, and have similar wide-ranging significance in the USA as well as in South American countries including Argentina, Bolivia, Peru, Colombia, Chile and Brazil.

The growing interest of national conservation and environmental organizations work with teachers who wish to bring children outside to learn contribute to the efficacy of such programs. For example, the National Wildlife Federation’s “Schoolyard Habitats[®]” program (NWF, 2002), which boasts of over 1500 certified sites in 49 states, provides collaboration opportunities, planning, curriculum resources as well as small seed grants for teachers. Another example is the Center for Environmental Education (CenterforEnvEd, 2002) which is affiliated with Antioch New England Graduate School. This center provides support and curricular materials for educators interested in schoolyard field studies. In addition, there is a variety of school habitat networks state programs which provide resources, workshops, and advice for creating habitat sites on school properties. For example, programs are active in Connecticut (Schoolyard Habitat Network, 2002), Georgia (Need citation) Florida (Florida Schoolyard Wildlife Projects), Maryland (Maryland DOE, 2002), New York (Doyle & Krasney 2003) and Ohio (Landis, 1994)

Other sources of ideas and curricular support for teachers are the Green Teacher magazine that is written for teachers interested in hands-on EE and schoolyard natural areas (Greenteacher) and the Evergreen Foundation (Evergreen, 2002), a national charity organization is designed to help “bring nature to our cities” and helps schools and teachers create outdoor classrooms.

Researchers, environmental educators, teachers and others often value environmental education (EE) programs that take children outside or at least out of their classrooms to alternative settings (Simmons 1988, 1993, Young, 1992). As Hogan (2002) explains, programs that involve immersion in alternative settings outside the school for environmental education are designed to enhance student environmental competencies and affiliations with nature, thus providing exciting opportunities for learning. She roots her research about school/community partnerships in situated learning theory (Brown, Collins, & Duguid 1989, Lave & Wenger 1991). Hogan (2002) believes that under certain conditions, learners pick up practices and environmental attitudes and skills best if they are involved in “the local milieu of a disciplinary community (p. 414). Learners know from doing in situ, on site where the naturalist, scientist, or environmental organization is actively at work. However, Simmons (1988, 1993) discussing field trips suggests that classroom teachers also identify various logistical and political constraints such as funding, cost, safety, and a lack of time in the school day. Her informants reported that if they were to take their students to a setting like a river, pond, marsh, or woodland, they would need an expert or naturalist along. Simmons (1993) also found that teachers she surveyed were more likely to use “built” settings (e.g., classrooms, museums, zoos) far more than more natural settings (e.g., forest preserves, nature centers, city parks) to teach about the natural environment. Research also indicates that the quality of the experience, if it is educative or not, is far less certain. Hogan (2002) in her study of school/community partnerships for

environmental education at the high school level, concludes that the educative value of these programs depends on three things: keeping the programs from falling into the normal school routines, whether or not the cooperating organization has a willing and able staff with ample resources, and if there is a strong apprenticeship structure that empowers student participants. Science centers, one venue for elementary school field trips, are often criticized for being “hands-on” but not “minds on” (Wymer, 1991) and the education that goes on in these places lacks sufficient focus on science (Shortland 1987, Tunncliffe 1997). Researchers also report that teachers often have an especially difficult time imagining the educative value and use value of urban natural areas (Simmons, 1993, 1998).

We have little data about the impact of programs offered outside the classroom and it is not clear what factors are most significant in determining why some programs might be effective and others less so in terms of student attitudes and learning outcomes. It seems that even if an EE programs that bring children outside are available, well designed and implemented well, it does not necessarily mean that teachers will use them at all, let alone use them well. We now turn to a brief discussion of research that examines teachers’ perspectives on taking children outside to learn.

Research About Teacher Perspectives on In-nature Experiences

Student experiences and the quality of their learning depend to a great extent on their teachers. The National Standards for Science Education (AAAS 1990, NRC 1996) include specific guidelines for teachers and teacher preparation programs that will help improve science literacy in students. There is also a limited amount of research published that examines teachers’ opinions about and experiences with taking their students to natural environments to learn. In the *Journal of Environmental Education*, two authors recently reported research related to teacher self-reported opinions. The first examines secondary teachers use of the outdoors and the second author examines elementary teachers’ perceptions of using natural areas for instruction.

In the first of these research studies of teacher opinions, Keown (1986) sent questionnaires to secondary natural science teachers around the United States asking them fifteen questions about their use of the outdoors in their curriculum. 5,000 names were chosen from the NSTA listing of biology, earth science, and environmental science high school teachers to receive the survey. The research questions that drove the questionnaire ranged from: “How often and for what reasons do science teachers use outdoor resources in science?” To “What are teacher suggestions for using and improving the use of outdoor resources in science learning?” (p. 24). The researchers report a 37% return rate. The article provides each survey item with a chart of results for each. The majority of teachers in the different areas of science (ranging from 23-36%) reported taking their classes outdoors infrequently; about one to two times a year. It seemed to these researchers surprising and contradictory that the majority of the teachers also reported that they highly valued taking students outside. According to the authors, there are several possible reasons for this contradiction. Almost 83% of the respondents felt that the school curriculum doesn’t encourage natural science teachers to take learning outdoors. The researchers also explain that conflicting class schedules, class size, lack of time, lack of college preparation, and liability issues were

among the factors that kept most teachers inside most of the time. Of those teachers who did report taking their classes outside, almost 70% reported that most of the outdoor activities occur within walking distance of the school and require no more than one classroom period of time. The authors conclude that if teachers are to use the outdoors in their teaching, they will need greater support, better courses and workshops that teach teachers to use the outdoors, and pre-service college preparation that includes “field studies and activities that concern improvement, understanding, and monitoring of the environment” (p.29).

Simmons (1993, 1998) works from the assumptions that teachers’ perceptions of nature and of the importance of providing environmental education determines students chances of experiencing natural areas (Simmons, 1993). This researcher published two similar studies in this journal on teachers’ perceptions of using nature as a learning environment. In her earlier study, Simmons (1993) interviewed 39 urban elementary teachers for their perceptions and preferences of different natural settings. She showed each teacher photographs of different types of natural areas, such as woods, parks, rivers and ponds, urban areas, and school grounds and asked them about their perceptions and ideas about possible uses of the sites. Teachers expressed a preference for environments with water and densely wooded areas over any of the other sites. Significantly, sites on school grounds received the least amount of preference.

Findings indicate that teachers prefer settings that are more removed from people and removed from school buildings for environmental education purposes. For example, Simmons reports that one teacher, while looking at a photograph of a woodland, said that “This is unspoiled nature” (p. 12) and therefore preferable to disturbed settings. Simmons also reports that of all the possible activities they could choose from for student experiences, recreational and identification-type activities were mentioned most often. Only a minority of the teachers mentioned activities that involved ecosystems, insects, or the impact of humans and she found that teachers felt county parks provide recreational but few educational opportunities. In conclusion, Simmons suggests that teachers perceived distinct differences in nature settings and in their opinion, different settings were conducive to different teaching and learning opportunities. Simmons also suggests that teachers associated a need for different resources, support services, equipment, and logistic support with different settings. She concludes that teachers need training to expand on their repertoire of possibilities for different settings. Simmons also states that the way a natural area manager or environmental educator introduces a site to a teacher may well determine the fulfillment of educational goals.

In her second study Simmons (1998) again focuses on what elementary teachers or urban minority students perceive to be benefits and barriers to different types of outdoor environments. Simmons again showed teachers photographs of different types of more or less natural settings. She was interested in “personal comfort levels and their judgment of educational affordances, as well as their perceptions of potential barriers” (p.24). Similar to the findings of the previous study, wooded and water environments more chosen by teachers as more suitable than other sites for environmental education. However, teachers also identified these two environments as more

dangerous and risky than parks or urban settings. They were concerned about safety, poisonous plants, and the possibility of getting lost. Most of the teachers surveyed say it is important to provide nature experiences in the curriculum, that their students would enjoy such experiences, and that outdoor experiences are worthwhile for students. They also reported confidence in knowing what to do with students in natural settings and were not particularly worried about not knowing the answers to student questions (p.31). As in the last study, teachers were not overly enthusiastic about urban nature as a learning setting and they were surprisingly ambivalent about county parks. Simmons also points out that teachers were apprehensive about their own preparation, comfort in teaching outside, and their training. Teachers expressed a desire for more training and felt more training would be required before they could take their students outside to natural areas. Simmons concludes that teachers were “both enthusiastic and somewhat confident, yet apprehensive, about teaching in natural areas” (p.31). The author believes that training programs should address these teacher views and directly confront their fears.

Although there is a limited amount of research about the use of natural areas on or adjacent to schools, research does suggest that k-12 teachers and other educators deeply value outside learning experiences for school children. However, for several reasons, outdoor learning experiences, especially in urban settings and also sites on or adjacent to school property are rarely sustained, only infrequently used, and seldom institutionalized or incorporated into the school curriculum. We now turn to the participant perspectives in our case study research to gain further insights into the potential and use value of taking children outside to learn. Our research is about an exemplary urban school environmental education program that included the establishing of one-acre natural areas, or land labs, on Parks property adjacent to five elementary schools.

Research Design

This research is a case study of an urban education initiative to institutionalize teaching and learning in natural areas adjacent to city schoolyards. Our particular focus is on adult participant perspectives on the history and viability of an exemplary grant-funded program. The research was qualitative with repeated formal and informal interviews, participant observation, as well as collecting and examining written artifacts. Written documents included grant applications, letters to stakeholders, school policy documents, and lesson plans used in participating schools. The City Parks Nature Education Programs Director, who is given most of the credit for the success of the program, was a special informant. The researcher also interviewed elementary school principals and teachers, both individually and in groups, in each of the five participating urban elementary schools. Teachers who were identified by the Nature Education Programs Director, administrators, and other teachers as leaders in this initiative were interviewed. Other teachers who identified themselves as uncertain about or resistant to using the natural areas for instruction were also interviewed. These interviews were informal and conversational. The researcher also interviewed the Educational Director at the local botanical gardens who in the past directed school gardens programs and could provide first-hand knowledge of local and state-wide “Habitats for Learning”

initiatives. Interviews included conversations about benefits and barriers of creating, using, and sustaining natural settings for environmental education in elementary schools.

Interviews were tape-recorded and field notes written. Analysis was on going and the results of each interview informed the successive interviews. Tape recordings were transcribed, coded according to an original conceptual coding scheme and entered into an NUDIST data analysis program. Themes and categories emerged from the data (Straus & Corbin 1990).

Findings

Data Analysis And Findings

At the end of the first two years of the PARK-IT! program, when the first round of grant funding ran out, there were only four of the original five land labs left. In some ways, these four surviving programs showed reasonable success in reaching the PARK-IT! goals and expectations. In other ways, the results were mixed and even disappointing. By appearances, at the time this research was conducted, trees and other plants were growing and there were dramatic successional changes happening to make these small areas rather wild and natural.. Animals like voles, song birds, rabbits and insects were frequently seen and seen more frequently as time went by.

PARK-IT! Curriculum Activities Guides were written, published and distributed free to each school (DuFour M.B., Couter L.K., & Garvin D.M. 1997). This is an exceptional 3-volume collection of activities for teachers to use in their classrooms and out in the land lab. The guides were written and published by City Department of Parks Recreation and Forestry naturalists for teachers to use with their land labs. Each activity was written in a clearly understandable lesson-plan format with explicit connections to the Ohio State Proficiencies for science education. Printing services were donated by the local newspaper. The Ohio City Hospital donated paper and binding. Coca Cola Company under-wrote the graphic design and layout. In 1998, these books won a National Media Award, "Interpretive Program Curriculum Category" from the National Association for Interpretation (NAI). Other successes informants listed for this program included an award by the OEPA Ohio Environmental Education Fund which distinguishing PARK-IT! as a model of the funded programs, children were brought outside at least twice each year, teachers claimed that their students learned while outside, and relationships were developed or strengthened between schools, neighbors, local businesses, and political leaders.

However, informants also talked about disappointments and problems with this initiative. As informants talked about these disappointments they seemed to relate to barriers and roadblocks that stand in the way of success. On one extreme, these influences were so powerful at one location, City 5, the public elementary school geographically most centrally located in the metropolitan area no longer exists. D. Garvin, the director of the PARK-IT! program explained how this happened:

When I went to check on the land lab, it was gone! Evidently, a neighbor was concerned about potential litter, vagrants, and all sorts of 'vermin' in that "unkempt area." He called the Mayor to complain. ... (As a result,) City Parks Maintenance people came in and used a 'bush hog' on it-- mowed down all the pin oaks, hawthorn, ash and other plants we planted there. The fence had been taken down and put in storage.

When this researcher asked Garvin how this could happen, he explained that in spite of extensive public relations efforts to involve neighbors, anticipate their concerns, and alleviate negative perceptions, this natural area fell victim to political pressure. I now turn our focus to the four surviving school land labs and the educators that deal with pressures for and against this initiative. Lessons learned here will have significant implications for any significant curricular or institutional change effort. In the following sections, I present participant perspectives of the roadblocks and barriers that stand in the way of this program designed to take children outside for field studies. Although informants talked a lot about these negative influences, most of them valued the PARK-IT! Program, talked about being thankful, and were quick to give advice about how program developers and educators can deal with these influences to make this initiative work in powerful ways to improve student learning. Consequently, I follow the discussion of barriers and roadblocks with participant perspective of possible solutions or ways to alleviate these negative forces at work to stand in the way of success.

Barriers and Roadblocks in the Way of Schoolyard Studies

In this section, I present assertions and supporting evidence about the barriers and roadblocks participants identified that stand in the way of the PARK-IT! Initiative. One such set of barriers is related to personal and professional pressures that stand in the way of bringing students outside to learn. They include limitations in what science teachers know, a tendency for traditional in-classroom teaching, and management concerns that relate to teaching in outside settings. Another set of barriers and roadblocks participants described is made of institutional, systematic and administrative pressures. This set includes lack of time, pressures related to high stakes testing, and teacher and administrator attrition that results in a loss of institutional memory.

How teachers know and teach science stands impedes teaching in schoolyards

Although there were significant efforts by the program designers to prepare and train teachers and provide "all the support and resources they would need" (Garvin) many of these elementary teachers feel they are still not prepared in science content knowledge. Mr. Mariano, principal at City 1 School explains that many of his teachers "know a bunch of little things that, in the end, mean nothing. It's all disconnected with the real world and has no relation to anything practical." Teresa Wilson, a teacher at City 1 School used almost identical language in describing the science many of her peers know: "They know a bunch of little things, facts that have no relationship to anything." The science they know is factual, lifeless and "textbook knowledge." It is

also neat and organized if one merely progresses from one textbook chapter to the next. This makes following the textbook straightforward and predictable. However, according to Wilson, using the traditional textbook approach does not require much science understanding by teacher or student: “I don’t think science makes sense for the teacher and the learner “(Wilson). Melissa Etheridge, another teacher at City 1 is more specific about the science teachers know: “They still think that science is in the textbook or in the teacher’s head. What counts is what you know and can recite.”

Inquiry in natural areas involves messy places, dirt, and the changes that happen in ground laid fallow. Bringing students outside means risking bad weather, dealing with appropriate clothes and dirty hands. This just does not sit well with many of us who like things neat, manicured and managed well. This might come from our culturally situated desire to control nature and manage natural areas into cultured weed-less lawns. For example, Jenny Adams, a third-grade teacher at City 2 stated that: “One time my class went to the land lab the students were not interested because it was quite overgrown and the students just didn’t like it.” Adams and her students did not appreciate the intention of the program to let the land lab become overgrown as natural grasses and other plants colonize the ground laid fallow. Instead of seeing this vegetative growth for its potential for scientific inquiry, teachers like Adams see weeds and vermin.

Ms. Watson, another third-grade teacher in the same school goes a little farther with her criticism. She sees the land lab vegetative growth as a result of poor human management and a lack of maintenance: “The land lab should close--the maintenance is very poor.” Another teacher in City 2, Marsha Stewart, stated that when she tried to use the land lab for teaching, “It (the land lab) was too full of weeds to plant our science projects.” Her second-grade curriculum included an experiment in which her students were asked to plant seeds and observe them grow. She felt she could not plant her seeds in a weed-infested area. “We used plastic cups instead.” She felt she could manage her students growing seeds in plastic cups in her classroom better than outside where the outcome is much less certain. This sentiment helps us understand a first grade teacher’s complaint about her school’s land lab: “It (the land lab) is too overgrown with weeds every time I go to use it!” Stephanie Powers went on to explain that she took her students outside only once and found the land lab un-usable because the experiments in her textbook were designed for classrooms and not natural areas with weeds and overgrown vegetation.

According to Melissa Etheridge, a City 1 teacher who uses the land lab at her school quite regularly, teachers need to know science differently, need to open themselves to creativity and become inquisitive about messiness and unpredictability. They “need to know about inquiry, need a curious mind, and must understand how to stimulate inquiry in their classrooms...they need an inquisitive mind.” Mr. Mariano (City 1 Principal), also explains that teachers need to know science as inquiry and need to adopt a questioning attitude: “Teachers really need to know all those inquiry types of learning. They need to be inquisitive (if they are to use the land lab).”

In a similar way, Dan Standford, a 5th grade teachers explained that teachers need to be inquirers themselves if they are to teach children to inquire. Stanford agrees that this way of thinking and teaching contrasts with textbook teaching and learning.

It's a way of knowing, this inquiry. You've got to own science in your own mind the same way that you would teach it. So if science to you is textbook kind of knowledge, well when you teach it, that's what you're going to teach. On the other hand, if science to you is inquiry, and asking questions and searching out answers and that sort of thing, then you're more likely to bring that into your teaching.

Traditional teaching stands in the way of bringing students outside to learn

In addition to limitations in ways teachers know science, informants explained that teachers need different, non-traditional pedagogic knowledge in order to bring students outside to learn. Valerie Stanford, a prior teacher and now parent and naturalist who works for the local metroparks talked about teachers who are not very comfortable teaching in non-traditional ways. She also said that teaching with field trips to the schoolyard requires a certain comfort level with non-traditional teaching and a willingness to leave the comfort and safety of the classroom.

It takes, from my opinion, from certain teachers that I've seen, that special blend of...being comfortable in teaching in non-traditional ways and doing things outside the classroom. And there (needs to be) a comfort level there (Stanford).

Dr. Honderd, principal at City 2, explains that many of his teachers tend to be very traditional in their pedagogy and that conducting field trips to the land lab appropriately requires a different way of looking at things: "It (taking students outside to learn) also takes teachers who are comfortable with teaching in non-traditional ways." When this researcher asked him to explain what he meant by this, Honderd described observing the non-traditional teaching of Garvin, the City Parks Naturalist and Director of PARK-IT! He described Garvin's presentation this way: "It was all hands-on, and it wasn't just teaching about insects in a factual way. It was about discovering what is out there and seeing what the land lab can teach us." Later, when Garvin was asked about this specific incident, he explained what he did this way: "It was about observing insects in their natural environment instead of just talking about them on paper and in textbooks. It was about letting the land lab and children discover together." His focus is on the relationships between the children and the natural environment. Garvin explains the PARK-IT! perspective of teaching in tall grass and other natural settings as a very different model of what students do and how they act when teaching and learning is best: "I need kids to look around and be very observant, whereas a traditional teacher oftentimes has difficulty with that. Teachers often want students to have their full attention on them" (Garvin).

Later, in another conversation, this researcher asked Dr. Honderd again why his teachers used the land lab so infrequently. Honderd suggested that teachers make choices for very practical reasons: "Are we going to teach from our textbook, which is real easy, or are we going to go to resource books like this (PARK-IT!) and make more homework for ourselves on a subject we don't understand?" He then held up the

PARK-IT! resource book and said: “There is great stuff here, but teachers are not going to take it home, page through it, and learn the science first, and then study how to do the activity.” It is much less problematic, perhaps more efficient and easy, for teachers to teach in traditional classroom ways.

Of course, teaching in the classroom from the book is familiar, safe and predictable. The methods are outlined, the content is clear and one chapter follows the next in logical order. However, some teachers explained that their decision about field trips to the schoolyard is more about how students learn best. For example, Cathy Hamilton, a fourth grade City 2 teacher explained that her students can’t easily sit down, listen, and do their work outside in the land lab: “I can’t really use the land lab because there is no place to sit for teaching purposes. The grass is too tall.” To her, teaching and learning happens best when students are sitting at desks or tables and teachers are standing and delivering information or instructions. According to Hamilton, if students can’t sit, listen and write, they do not learn well.

Garvin suggests that another student-centered reason teachers choose a traditional classroom orientation is related to classroom management concerns. They worry about their students misbehaving in the presence of a special guest. To illustrate this, Garvin described situations where teachers, out of courtesy and concern, took him aside to warn him about more challenging children just prior his leading a field trip. They warned him about certain behavior problems and potential trouble makers: “A lot of times I’ll have a teacher come up and say: ‘Alright, now watch Billy and Johnny and Fred, those three are always goofing around, you’re going to have problems with them.’” This suggests that teachers expect their “problem children” to act out in non-traditional settings. He is also saying that teachers try to do the right thing by helping him anticipate problems so that he can better manage the situation when control issues arise. He then went on to explain that, for him, teachers really do not have to worry about both of these issues and that this concern is unwarranted. “By the end of the day, I’ll have the same teacher come up and say: ‘Billy, Johnny, and Fred, really surprised me with their knowledge and enthusiasm.’” This does not surprise him because, as he explains, these “trouble makers” often cooperate better in non-traditional settings than in classrooms. “Actually, these are the kids that excel in this type of a setting. The naturalist wants children to observe everything. In the field, distractions are okay, even necessary” (Garvin).

In reflection, this suggests several confounding variables. Perhaps students like these “trouble makers” actually thrive in non-traditional settings, and perhaps teachers do not have to worry so much about losing control in outdoor settings. Perhaps Billy, Johnny and Fred would misbehave if their classroom teacher led the field trip instead of a naturalist, a guest who provides a novel situation. Perhaps Garvin has a special gift for teaching in informal settings. He does state that: “It’s a non-traditional setting where I thrive.” Teachers like Cathy Hamilton probably would not say this.

However, some of the teachers consider Garvin’s perspective on classroom control too simple and perhaps even naïve. One teacher in particular, Carolyn Chapman (City 3), explained that she teaches children with significant behavior problems that would be exacerbated by non-traditional settings. The result would be her pre-occupation with

discipline at the expense of good teaching and learning. “I teach Developmentally Disadvantaged kids and I do not use the land lab because of my students’ behavior issues. It’s (her reluctance to take students outside) more due to the behavior of my kids than the value of the land lab itself.”

Institutional, Systematic and Administrative Pressures Discourage Teachers from Taking Students on Schoolyard Field Trips

Informants, during interviews and conversations, discussed several institutional roadblocks and problems that they face when implementing the PARK-IT! program. The first roadblock is an ever-present time pressure that stands in the way of any innovation. The second is the pressure they feel to teach to the new state standardized tests, those high-stakes assessments that create disincentives for change and innovations. The third set of institutional constraints is teacher and principal turnover and a resulting lack of institutional memory.

A lack of time stands discourages schoolyard field trips

During the interviews and conversations with teachers, the most common roadblock teachers mentioned was the pressure they feel to cover a large amount of content in a short amount of time. If they already have a full curricular slate, it is easy to understand how a lack of time might stand in the way of anything extra-ordinary. They are also regularly introduced to a rather continual and endless flow of educational trends and initiatives to choose from. Consequently, their first reaction to a new initiative is to consider it just one more distraction or burden that will pass with time. Or, it is also possible that they anticipate some value in it and, instead of adopting it in its entirety, they try to adapt the appropriate parts to fit their own agenda. Limited time and energy become deciding factors. As Theresa Wilson (City 1) explains,

I don't know if it's because teachers are feeling so overwhelmed to incorporate so many things into a day that they look at it (a new initiative) as a burden, as one more thing to teach versus how they can use their traditional curriculum, adapt it to that, and use it to enhance their curriculum.

This researcher heard informants talking about time and energy as a deciding factor, in three ways. First, every teacher’s school day and school year is short. Dr. Honderd, principal of City 2, describes his teachers full daily schedule in terms of contact hours: “Our teachers, have only five and a quarter hours contact with the students a day.” He said this in a way that it made it clear this is not enough. His teachers always feel pressed for time do cover the amount of content they are expected to. Not only is their day short, but there are only 180 days in each academic school year.

The second, closely related way informants described time pressures refers to curriculum demands placed on teachers. Honderd, reflecting on the time teachers have to cover the expected content at a specific grade level: “That’s not much time for what

they have to cover. The curriculum demands are extraordinary—each teacher has a full slate.” Dan Stanford, a 5th grade PARK-IT! teacher (City 3) is more specific about curricular demands and considers certain priorities forced on him. “The focus is on teaching kids to read” Mr. Stanford, elaborates on the time constraints and implies that time pressures are forcing conversations about integration of subjects and more efficient teaching: “There’s not enough hours in the day to teach strictly science, teach strictly math, teach strictly reading anymore.”

Theresa Wilson (City 1), relates her time pressures directly to the high-stakes proficiency tests and the current curricular demands for reading and mathematics:

Because of the time, you’ve got so many minutes for reading, so many minutes for writing, you have to get your math in, you are being tested. You are under that kind of pressure academically. I think that is what prevents teachers from developing into the kinds of teachers that we know would really affect children’s learning.

This researcher then asked Wilson to elaborate on this and relate it to the use of the schoolyard natural area for field trips. She responded this way: “You are going to have to work with the time element because they’re going to want to do reading or math. The way the proficiency tests are, don’t even bother that teacher about taking time away from tested subjects.” The clear implication is that the value of any activity, including field trips to the schoolyard must be measured against these curricular pressures. Time is very limited.

The third closely related way informants talked about time as an institutional constraint put the focus on field trips as extra-ordinary. Extra-ordinary activity like planning field trips to the schoolyard actually requires more time and effort than teaching “from the book.” Mr. Merchand (City 3 Principal) was first to explain the demands of extra-ordinary initiatives: “It takes a lot of time [planning field trips to the land lab], it’s painstaking especially in the early grades.” He went on to describe the necessity of gathering equipment, special clothing, and teaching materials. He explained that even if an elementary teacher tells students to dress for the weather the next day they invariably forget. One of his kindergarten teachers even keeps a collection of winter jackets in her closet: “I keep this collection of hats, mittens and jackets. My kids don’t dress for the weather” (Chapman). She does this for other reasons besides field trips to the land lab. She went on to explain that some of her urban students do not even have proper clothing to take to school. Therefore, if she does not keep this collection it is unreasonable to expect her students to go outside in cold weather. This type of concern complicates her life as a teacher. Merchand feels a bit guilty about expecting his teachers to do these extra-ordinary things because “You’re giving a teacher more homework.” He tries to protect his teachers from extra demands on time and energy because: “At the end of the day, we’re already all tired and don’t need another set of demands on us.”

One recent and significant factor that relates closely to this time pressure has been high stakes proficiency testing. Teachers do not feel as free with their time and how they spend their planning energy as they once might have. This recent trend involving

high-stakes testing is examined in more detail in the next section of this analysis.

Pressure to teach to the high- stakes tests discourages schoolyard field trips

As in many states, Teachers in Ohio are often reluctant to adopt any curricular additions in a climate of concern and perhaps even preoccupation with standardized proficiency testing. They know that their reputation and the reputation of their school depends on students' performance on these state tests. The media notices and reports school test results and schools are ranked, labeled and judged by test scores. For a mixture of complicated reasons, urban schools often rank lower than their suburban counterparts. This raises the stakes of proficiency tests for any teacher and any administrator. Dr. Honderd (City 2 Principal), explains the practical implications of this pressure in simple terms: "They have to follow a curriculum that's in their schoolbook. They've got to get ready for proficiencies." Thus for practical reasons, participating in PARK-IT! depends on whether or not there is a clear connection to proficiency test scores. Significantly, then, informants in this study sometimes find it difficult to see the connection between taking the time to take students outside and student performance on proficiency tests. One of Honderd's teachers, Theresa Watson, explained it this way:

I think the proficiency tests also took away from the momentum (of PARK-IT!) because proficiency tests came along about the same time that the creation of these land labs was happening. ...It was hard to really immerse yourself in that and have these five subject areas to get your children ready for the proficiency tests.

Wisely, Garvin anticipated this problem when he designed the PARK-IT! activity books. When asked about the activity books, one of the first things he said was: "We made sure that each of the activities is keyed to the Ohio State Standards for Science Education." In spite of this pre-planning, this researcher soon realized that referencing the proficiencies and outcome objectives does not necessarily convince teachers that spending time in the land lab will help them teach to the test and prepare their students for higher scores. The problem is that when the PARK-IT! resources were developed, everyone's focus was on the State Standards for Science Education. Referencing these standards was a wise decision at the time because the authors anticipated educators' demands regarding these content standards. However, informants explained that during the last few years, the focus has turned from the Standards to the Proficiency Tests. This confused this researcher at first because the Standards and the Proficiency Tests are intended to be congruent and related to each other in very close ways. In fact, the proficiency tests are designed to measure the minimal learning outcomes as described in the State Standards for subject matter. However, when this researcher asked teachers about this, it became clear that they look at the Standards and the Proficiency tests a bit differently.

Dan Stanford, during a conversation with this researcher and Janice Harmon, a special education teacher in his school, explained: "It is not really the Standards any more. Now it is all about anticipating what questions will be on the next Proficiency

Test.” Noticing this researcher’s confusion, Stanford elaborated a subtle difference: “You would think they were related. But that is not necessarily the case. It’s the test that counts.” She went on to explain that teachers, instead of using the Standards documents as a curriculum guide or resource, spend a lot of their time reviewing sample Proficiency Tests and sample test items. They try to analyze the sample test items, predict the likelihood of similar questions in the coming test, and prioritize their teaching objectives accordingly. The implication is that curricular materials explicitly linked to State Standards might not help teachers justify field trips to the schoolyard like the authors intended.

Teacher and principal attrition stand impede schoolyard field trips

Teachers and principals who may be leaders and supporters of the land labs are often quite mobile in this urban district. Many of the teacher informants listed administrative support as an important factor in the success of any curricular initiative. If the principal leaves the school, he or she takes this support and the developmental history of the land lab with him/her. The next principal might not have the land lab on his or her priority list. Likewise, if a teacher who enthusiastically and regularly uses the land lab moves to another school or retires, she/he takes some of the peer support and institutional memory along.

Informants suggest that it is difficult to start, let alone sustain any significant curricular change in the current climate of teacher and principal mobility. Dr. Honderd (City 2 Principal) said that of a staff of twenty-five, he has, on average, three or four teachers leave each year. He explained that this is rather typical in schools in this urban, union-controlled district. This is due in part to the fact that seniority is the criterion used in “teacher rotation” decisions. This means that tenure is often short in his school because teachers tend to “rotate” to schools on the outskirts of the city. Shelly Smith, a teacher in Honderd’s school explains that their school program was going along nicely until one of the lead teachers in the program left them: “Unfortunately, the science teacher who started this program left for a position in another state and no one followed up on the project.” Mr. Merchand (City 3 Principal) also said that teacher changeover as one of the major factors that he sees standing in the way of the use of his school’s land lab. In fact, since the PARK-IT! program was instituted in his school, only one of the original teachers on his staff remains. Merchand explained that even this teacher recently moved from teaching 5th grade to 2nd grade—a move that preoccupies her time and energy.

Merchand explained that teachers have a need to share their projects with others: “Some teachers will pick it up through sharing with each other—and they support one another.” But they have a very difficult time sustaining programs like PARK-IT! when their peers leave them for one reason or another. They “get it and then they move on, retire or whatever. That’s where the program gets lost again.” Curricular programs often depend on one or two teachers who take on a leadership role. If one of these leading teachers retires or moves to a different school, the program tends to waste away. Theresa Wilson (City 1) answered this researcher’s question about the success of the PARK-IT! program at her school by saying that the rapid turn over in staff creates demands on any curricular initiative.

I think it [success of the program] depends on a lot of things. ... (T)eachers are turning over, you have a lot of new teachers, you have teachers leaving, so the curriculum's sitting there, the momentum in the beginning has left. If you have a new person, you've got to get that picked up again. That has to be attended to.

Dr. Honderd, in reference to City 5, the school that no longer has a land lab stated that this school “had gone through about eight different principals in the past five years around the time talk about the land labs began.” This is significant because, according to these research participants, it takes the dedicated, enthusiastic support of the school principal to support a school natural area. The principal bridges the gap between parents, neighborhoods, organizations like the parks department and the teachers. Without the principal’s support, programs like PARK-IT! could never succeed. Garvin explains that every time a new principal comes to a school, he must begin the process of “selling the program” all over again. The milestones, institutional memory and understandings go with the principal when he or she leaves a school system.

In the previous sections of this analysis, the case is presented that there are personal and professional as well as institutional and systematic barriers and roadblocks that stand in the way of the success of the PARK-IT! initiative. Although, without exception, the informants say they value PARK-IT! and they value taking children outside to learn, they also realize that impediments or roadblocks stand firmly in the way of the success of this program and programs like it. However, this research also provided informants a forum for describing what they thought was necessary to ensure the success of schoolyard programs. In the next section of this data analysis, assertions are listed with confirming evidence about what these urban educators think would actually help the schoolyard natural areas reach their full potential.

Solution #1: Teachers Need Well-Crafted Materials & Resources For Instruction

According to informants, it is vital to have good curricular resources available if they are to use the outdoors in instruction. As mentioned earlier, the Department of City Parks and Recreation, anticipating this need, wrote and published a series of three “PARK-IT” Curriculum Activity Guides that hold a collection of lesson plans for use in the land labs (DuFour M.B., Couter L.K., & Garvin D.M. 1997). They gave these books to teachers in the schools along with a library of reference books for every grade level of each school. According to Garvin, this collection of resources includes “everything they need” to help teach children in the natural areas adjacent to their classrooms. “We didn’t just create land labs and walk away. We wanted to give teachers the tools to enable them to use these resources-- more than just resources; a plan of action and a course to follow.” Garvin explains that these activity books are invaluable resources for the teachers who want to use the school natural areas.

They're [the land labs] just a field of weeds without these guides. [My staff and I] decided on a format... The project concept was ... we need to write it in a format that would be useful to teachers in elementary schools. And as we wrote

these drafts, my co-author who is also an educator said: "Denny; this is how you write a lesson plan." ...So we wrote them in teacher's language regardless of what subject they taught and then we also identified the various subjects that a lesson would cross.

The authors did not want the books to be considered just a collection of lessons or activities to use on field trips to the schoolyard. They intended the books to be a curriculum guide, a progressive series of learning experiences for students and teachers as the academic years progressed and as students got older. The authors anticipated regular use from kindergarten through 6th grade.

...Our intent was that teachers would follow these curriculum activity guides because the lessons and even the guides build upon each other. There is one guide for K-1, and one guide for 2-3, and one guide for 4-6. And they all follow 4 topics—water, soil, plants, and animals. And each topic for every grade level has 2-4 different lessons, plus extensions if a particular group of kids really get jazzed about something. And, all the activities cross the curriculum. We incorporated mathematics, geography and spatial organization, journal writing, natural history, and science in all of them. ...We wanted to give teachers the tools to enable them (to teach in their land labs).

Teachers who use the PARK-IT! books regularly spoke very positively about them. However, teachers typically receive a plethora of activity books and guidebooks for one area of the curriculum or another. Many of these books end up on the bookshelf or in a drawer gathering dust. The implication is that the books wouldn't help teachers much if they were merely brought in and given to them without careful, sustained support from Garvin and his staff. As one teacher explained: "They are nice. Denny (Garvin) came out and helped the teachers the first two years do lessons, and he was hoping that they would repeat those and maybe get more lessons from the PARK-IT! book."

Solution #2: Teachers Need Well-Crafted Training Experiences For Using Natural Areas

According to research informants, teachers have never really had adequate training in the inquiry style of learning that would give them the integrated knowledge they would need to teach outside in powerful ways. Melissa Etheridge (City 1 teacher) explained that teachers need training in order to know about inquiry and then must understand how to stimulate inquiry in their classrooms.

Teachers know a bunch of little things that mean nothing. ... The animal world--they don't know how to read an animal, like if they're nocturnal or not. ...And to read a tree. All those inquiry types of learning. They need to be inquisitive. That takes training, and it takes training in the early years of the teacher--especially pre-service. That has to be well connected to the undergraduate training and then the school system that they go into.

Etheridge goes on to explain that teachers need to be inquirers themselves if they

are to teach children to inquire.

It's a way of knowing, this inquiry. You've got to own science in your own mind the same way that you would teach it. So if science to you is textbook kind of knowledge, well when you teach it, that's what you're going to teach. On the other hand, if science to you is inquiry, and asking questions and searching out answers and that sort of thing, then you're more likely to bring that into your classroom.

One vital component of Garvin's strategy was to provide carefully planned in-services (teacher training sessions) for teachers at their schools. Garvin himself went to each school during the first year of the PARK-IT! program and led after-school in-services for interested teachers. These in-services were specifically designed to teach teachers how to use the "Activity Guides" he designed for the program. His strategy was to actually "run through an activity in the book with them so that they could do that activity with their kids on the following day." Although his goal was for the teachers to be rather independent and self sufficient, he realized that they would need guidance, especially at first. He explained:

Our ideal situation is that they would follow the curriculum activity guides because they build upon each other. ...So that's what I would like to see. If a teacher is working at a place that has an acre set aside for them to use, it's okay for them to look at that as a field of ever-increasingly large weeds and small trees to go: "What in heaven's name can I get out of that except burrs and mosquito bites?" So, we would like them to feel comfortable opening up the curriculum activity guide and doing a lesson right from the beginning. An introductory lesson in soil profiling is an example, seeing the different horizons that are in various weighted materials of sand, silt, and loam.

Theresa Wilson (City 1 teacher), reflecting on Garvin's presentations explained:

He (Garvin) modeled for us how we could use these activities. Teachers who would never just open a book and use it on their own and go out there and do it, so it just filtered down into something teachers could use and do. So we got more mileage than just teachers who knew how to do it and would do it on their own anyway.

Carrie Simpson, a former teacher and now parent of one of the PARK-IT! schools also explained that teachers at her school need in-service training as well as instructional materials that can become part of the school's curriculum. Specifically, according to her, teacher training should include hands-on experiences.

It is also important that when they are learning something for the land lab, the teachers actually need to participate hands-on in the learning rather than just listening to someone tell them how to do an activity.

However, Simpson also went on to say that teacher training should have certain other characteristics. Teachers are already busy and their plate is already full.

Therefore, according to her, they need the time to experiment with a modeled approach to the curriculum materials. By this she means that even if the written resources are excellent, teachers need to be lead and should do the activities themselves before they are expected to use them in their teaching.

Most people learn by doing, and whether it's a student in one of my classes [or not]. Most people would never take the time, the hour and a half to two hours to sit down and read and do it. Where compared to somebody else who's lecturing —“You can do this and you can do that”— they'll never get around to doing it. But if you actually have them do it themselves, then they get hooked on it

Janice Harmon (City 3 teacher), who is known for her enthusiasm for and leadership in the use of land labs explains that training works best when teachers are intellectually engaged and immersed in the process. She relates teacher learning to student learning—best when they engage intellectually in the experiences and adopt a new initiative as their own. Once they do that, teachers should realize that the learning process goes on for an entire professional career.

You know how we have to immerse children into science and reading or writing. We don't immerse our pre-service or in-service teachers in the art of that type of teaching. It's not enough for them to go on unless they take it on as their own and develop it over 18 years or so.

Another apparently important characteristic of teacher training is that it is sustained throughout the school year and from year to year. One reason for this is that new teachers need to be inducted in the land labs procedures as well. For example, Larry Alexander, a new 5th grade teacher wrote on the PARK-IT! evaluation form that new teachers especially need training and guidance: “As a new teacher to the building it would help if someone would help new teachers to know how to effectively use the land lab.” Melissa Etheridge, a veteran teacher in the same school explained that Garvin's intention was to continue training sessions beyond the first grant-funded years: “(Garvin) came out and helped the teachers the first two years do lessons, and he was hoping that they would repeat those and maybe get more lessons from the PARK-IT! book.” She, as if elaborating on Alexander's request for new-teacher training, went on to explain that teacher training needs to start early in a teacher's career.

That takes training (teaching through inquiry), and it takes training in the early years of the teacher--especially pre-service. That has to be well connected to the undergraduate training and then the school system that they go into.

Valerie Stanford (former teacher), when asked about what could possibly help support more frequent instructional use of the schoolyard land labs, stated that use might depend on many things but at least one thing in particular:

I think it depends on a lot of things. The teacher training, it has to be continuous. So he came out and said, this is an activity in the book, let's run through it. And once he did that, he left and those teachers then felt

that they could do that particular activity. They then repeated it in their classroom.

Although the training was intended to prepare teachers to not only do the demonstrated activity the next day, their preparation in one sample activity would prepare them to go ahead in the activity book curriculum on their own. This seldom worked as intended. Teachers often did the demonstrated activity the next day with their children but they seldom actually followed up with successive activities on their own. As explained earlier, they seldom picked the PARK-IT! books off the shelf and followed up with the curriculum on their own. This researcher was very curious why, in spite of sustained teacher training, the schoolyard land labs were seldom used between training sessions. When informants were asked about this, it became clear that training sessions alone will not result in frequent use of the schoolyard land labs for instruction. They need a network of support.

Solution #3: Teachers need a network of support to use schoolyard natural areas

In addition to well-crafted curricular materials and sustained training, these research informants explain that teachers need a strong network of support if they are to use the outdoors in powerful ways. This means that teachers need collaboration and peer support systems built into the school system. This is related to but goes beyond written resources and training. Mr. Mariano, (City 1 Principal) explains that when the land labs project was first proposed, the administration and the Parks Department promised them support: “We told them that we wouldn’t just book a faculty member out there without supporting her. We promised them (teachers) that there would be support from parks department—to come in and help us with it.”

Ideally, in Garvin’s conception, teachers would support each other as they plan and conduct lessons in schoolyard natural areas. He hopes that teachers will work together and form their own network of support. His grant-funded period was two years originally and he knew that if the schoolyard land lab program was not self sustaining, it would disappear in the schools. He knew that the future of the program depends on teachers using the curriculum guides on their own after the funding period ends--when he can no longer sustain the in-service training sessions. “There are a lot of things teachers can do. And if they learn together, which is what this is all about, it creates a very nice educational bond.” By “educational bond,” he is referring to teachers and students working together as well as teachers working with teachers. This contrasts with the instructional model where the teacher serves as expert and knowledge resides in the teacher’s mind. It has to do with developing the habits of mind where teachers and students work together and support one another --teachers working with students trying to discover what the world is like.

I have no problem telling kids when they hold something up and say, “What is that?” And then I will sometimes say: “I don’t know!” But then the next step is to come back and say: “Well I can find out.” And then I pull a book out. You can’t always bring things back, but I’ll ask the kids, “Well what do you want to call it?” And if it’s a tree with thorns on it and it’s got gray bark and red fruit, we’ll call it the spiky-gray-bark-red-fruit tree. And then come back and find out what it was in

a book using those descriptive words and open it up and say, "Well it's probably this." But when kids can find out that even an expert in trees isn't sure. They learn that even adults have to look things up.

Another way in which The Parks Department tries to create a network of support is to make naturalists available on a regular basis. One negative tendency, as Janice Harmon (City 3) explained, is that teachers often come to depend on the "expert" to come in and do their work for them: "The problem with some schools is that they do not want to use the parks personnel as a resource; they want someone else, and expert to do the work for them." In contrast, Harmon and other informants in this study thought that it would not be good for a school or school program to be dependent on the support of an "expert" who would regularly come into the school and show them what to do. Instead, they were more comfortable having a "naturalists on call" or "naturalists in residence" who wouldn't tell them what to do but be available for help when they needed it. As principal Honderd (City 2) explained:

He [Garvin] is looking for a graduate student, a naturalist to work with our teachers like an hour and a half each semester. A naturalist could be assigned to each teacher in the building and would be able to work with them out there, in the land lab.

When this researcher asked what qualifications this person would need, Honderd responded by saying that it probably should be more than one person. Teachers should have access to several naturalists who have different areas of expertise and are available for whatever the teacher needs help with at the time.

Even when you need a naturalist, you'll find a naturalist that's very good with plants, and you're going to find another naturalist that's very good with insects, you're going to find another naturalist that's very good with just edible plants, or just trees. You're going to find people that have different interests themselves, and that's what they're going to stress best to the teachers. ... They come out and work with them on trees and that would be a really neat thing, and another week have them sign up for edible plants, have another week where they sign up for something different. That would be a very valuable thing for the teachers because they will pick and choose what's appropriate for their grade level from what that person has to offer, and go with it.

Valerie Stanford, a parent and naturalist who has worked in such a capacity, gives an example of how a naturalist or even a community person might provide this kind of support:

Like, for example, parks personnel. If they could call somebody and say; "Okay, we'd like to set up a bird feeder area, what do we need?" They personally don't need to know every single bird who's going to come to the feeder, or every single kind of food that the birds are going to need to use, but to be able to draw on someone from the community, or a parent who may be a birder, or a parks person who can actually give that hand-holding type of experience.

During an interview, Theresa Watson, a third-grade teacher, explains that developing interdependence among teachers and naturalists is also quite necessary if programs like this are to succeed. Teachers and naturalists should work hand in hand as peers making individual contributions. Teachers, as they often do, should not just stand on the sidelines while the parks personnel take leadership role during the field trip. Their relationship should be more of a partnership with complementary roles.

Watson: *The teacher has to plan with that person and be directly involved and not standing back and letting that person do it. You have to make sure that teacher is learning. If the naturalist does the teaching, they [teachers] don't take any ownership as students themselves because they don't have to. It's often a relief if someone else is going to take care of that.*

Researcher: So how can you convince teachers that they're the ones that ought to be leading the field trip even if the naturalist is there?

Watson: *I think the planning in the beginning where they're intricately involved in the planning with that naturalist. "I'm not going to come teach your children unless you're helping me with this lesson plan. I'm not going to know what to do with your kids until I talk to you. You have to know something about your kids in science, what they know and what they don't know. I can help you learn how to read that in your students." Just like a doctor knows how to read cancer, he doesn't go to someone else to do that. He learns that.*

Researcher: The naturalist doesn't know how to do this either because he might just know how to lead the field trip?

Watson: *They don't understand the teaching, developmental part of the student that I'm talking about. You [the teacher] know what you need, it's hard to put into words. This is how you become successful in the art of teaching.*

Data Analysis Summary

This analysis suggests that there are a number of serious personal and institutional obstacles or roadblocks that stand in the way of teachers using schoolyard natural areas for curricular and instructional purposes. However, although these are significant, the same informants were quick to make suggestions for improvements that would alleviate or minimize the effect of these roadblocks. These suggestions included carefully-crafted curricular resources, sustained teacher training opportunities, and having a network of support.

Discussion

The literature makes the point clear that field studies and environmental education programs that bring students outside to learn in nature have significant impact on student perspectives; their attitudes, their individual land ethic and their concern for the environment. Other researchers present evidence that students improve cognitively,

improving their scientific content knowledge. Other authors claim that children learn some lessons more efficiently as a result of study in natural world settings. The literature also makes it clear that although most teachers value such experiences for their students, few actually make them a viable and sustained part of their curriculum. This case study of the PARK-IT! program, an urban initiative to support teachers in their desire to take children outside to schoolyard natural sites, suggests that there are many possible reasons for this lack of implementation. These should be seen in the context of an atmosphere in schools where everyone is so concerned about high-stakes proficiency testing and intense pressure for standards-based educational reform. Understandably, they have a hard time justifying any activities including field trips that do not have clearly articulated and convincing connections to better test results.

Implications for Success in Schoolyard Programs

Two important implications stand out in this research. These, in turn, lead to recommendations for any elementary teacher, administrator, or school change agent who wants to provide urban students with on-site inquiry in natural settings. First, all of the research participants, in one form or another emphasized that sustained teacher education is necessary for this kind of initiative to succeed. Second, the school faculty needs sustained, strong and effective on-site support systems.

Create Opportunities for Quality, Dedicated Teacher Education

Although the informants in this study use it, this researcher intentionally avoids the word “training” and prefers to say that schoolyard programs require high quality, relevant teacher education. The word training suggests that teachers need a bag of tricks or set of competencies to be able to take children outside to learn. In fact, some of the teachers we talked to would prefer training in the sense that a support person, a naturalist or environmental educator should come to their school and teach their classes for them. Their second choice is for the naturalist to “run through” or model an activity or lesson that the teacher can then repeat with their students the next day. In contrast, the support persons we talked to expressed the desire for teachers to be more independent of them, to be more creative, and to be more efficient with the resources available. They are convinced that teachers and school administrators are best equipped to make lessons outdoors dovetail with curricular mandates and particular student needs. For example, having a “naturalist on call” suggests a different support model than the tendency to “...Just want us to come in and do it for them” (Garvin).

However, teacher education alone is not enough to make field studies a part of urban school experience. We now turn to specific recommendations for developing the support networks teachers need to make field trips to natural areas their own and for institutionalizing field experiences as part of their own curriculum.

Creating Teacher Support Systems is Necessary for the Success of Schoolyard Programs

In each of the schools this researcher visited, there was one lead teacher or in some cases, a small cadre of teachers who were deeply committed to using the natural areas available to them. These teachers took their children outside quite regularly and served as a driving force by providing a contagious passion and enthusiasm. This positive influence seemed to carry down the halls to other classrooms and their example became a source of conversation in the teachers’ lounge. In addition, when one of these lead teachers left the school for one reason or another, the use of the schoolyard natural area dwindled dramatically (see teacher attrition above). Therefore, this researcher has come to the conclusion that directly supporting these lead teachers is more effective than spreading resources more evenly among teachers who not really interested or motivated. Hopefully, the efficacy, enthusiasm and success of these teachers will be contagious among their peers. The assumption is that leadership by example is more effective than coercion through training or in-service activities.

How can these lead teachers be supported in their efforts to curricularize and institutionalize field studies in their schools? The following is a list of suggestions generated by reflection about this research that describes the kind of support these lead teachers need.

1. Provide sustained financial and materials support.

The PARK-IT! program wisely gave to each school, a closet-full of carefully selected supplies that teachers were free to use. One of the problems with this model was the difficulty in selecting which supplies were most needed and most likely used. An alternative or additional way to provide supplies is to make funds available for mini-grants that teachers would apply for. In this way, teachers could have more autonomy in deciding which supplies and materials would help them most in their efforts to help students learn.

2. Provide lead teacher stipends and release time.

As described above, we believe that supporting enthusiastic, passionate teachers who are predisposed to provide field experiences for their students is one of the most effective ways to cause change in a school. These lead teachers should be supported financially as well as given the time to develop programs and curricular applications geared to their particular school situation.

3. Provide paid summer institutes for lead teachers.

Lead teachers could be given opportunities to use some of their summer time to learn how to lead in their schools as well as how to more creatively and effectively use the outdoors in their teaching.

4. Provide case studies for learning by example.

Teachers, like the rest of us, learn by example. Carefully constructed video and written case studies could supply efficient and effective teacher in-service experiences.

5. Provide teacher education support.

Teachers would benefit from school-year seminars, weekend retreats, and teacher field days. As described above, lack of teacher efficacy is a major roadblock to effective and sustained use of natural areas for teaching. Teacher experiences outside will help them feel more at ease and familiar, less threatened by the uncertainty and messiness of outside events.

6. Provide help in developing relationships of support.

Four kinds of relationships would support teachers in their efforts to use natural areas in their teaching. Developing programs to support these relationships will help ensure the institutionalization of field experiences for children

- a. **Naturalist-teacher relationships.** Teachers and administrators consistently told us that their use of natural areas in teaching depended on having “naturalists on call” or local, easily available human resources. These relationships could be provided electronically as well as in person but

the key is making these relationships non-threatening and convenient—a phone call or email away.

- b. **Teacher-teacher relationships.** Participants in this research made it clear that they need the emotional, intellectual, and material support of and collaboration with their peers. This would require common planning time and time for extensive discussion.
- c. **School-school relationships.** It became evident during this research that teachers learn from each other. Systems should be established for schools to share learning experiences, curricular materials, resources and other successes. For example, teams of teachers and/or students could visit other schoolyard natural areas to learn about these programs or to make presentations of their own projects.
- d. **Organizational relationships.** The success of the PARK-IT! program depended on relationships between the city parks department and the local urban schools. This kind of strong organizational relationship seems necessary for supplying the expertise, resources, and other forms of support teachers and administrators need in their programs. Participating organizations might also include local metroparks, state and national parks, college or university science educators, etc.

Policy Implications and Recommendations

Two important implications stand out in this research. These, in turn, lead to recommendations for any elementary teacher, administrator, or school change agent who wants to provide urban students with on-site inquiry in natural settings.

First, all of the research participants, in one form or another emphasized that sustained teacher education is necessary for this kind of initiative to succeed.

Second, the school faculty needs sustained, strong and effective on-site support systems including the following:

1. Sustained financial and materials support.
2. Lead teacher stipends and release time.
3. Paid summer institutes for lead teachers
4. Case studies for learning by example
5. Teacher education support
6. Help in developing relationships of support between
 - a. Naturalist-teacher relationships
 - b. Teacher-teacher relationships
 - c. School-school relationships
 - d. Organizational relationships

Summary

Results of this case study suggest that although participants agree that there are clear and significant educational opportunities for students, the viability of urban schoolyard nature initiatives depends on whether or not schools can address three related factors:

- The need for a cadre of enthusiastic teachers who are confident and knowledgeable enough to use the natural area regularly,
- the need for sustained and carefully-crafted support systems, and
- whether or not a pathway can be cleared through a very real and significant set of institutional constraints.

Further research should be done to determine whether or not successful and active schoolyard natural area programs actually result in improved student learning. Longitudinal research could perhaps tell us if learning in nature can help improve scores on high-stakes proficiency tests relieving some of the pressure these teachers feel regarding these tests, and thereby removing at least some of the institutional constraints to innovative educational programs.

Resources

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