International Journal of Early Childhood Environmental Education

ISSN: 2331-0464 (online)

Developing a Nature-Based Four-Year-Old Kindergarten Program: OAK Learning Center at Bay Beach Wildlife Sanctuary in Green Bay, WI (USA)

Scott Ashmann
University of Wisconsin-Green Bay, USA

Submitted August 28, 2017; accepted September 10, 2018

ABSTRACT

The challenges and successes of planning, implementing, and evaluating a nature-based four-year-old kindergarten program are shared as well as a description of the first years of the program that is designed to enhance the students' academic, physical, social, and emotional development. In addition, a description of how the partnership among a wildlife sanctuary, city, public school district, and university to create this program is provided. "Purposeful play" and ideas from European forest kindergartens are guiding philosophies for much of what we do. Forty students (twenty each in morning and afternoon sessions) have been enrolled for each of the past five academic years. They are taught by a licensed teacher and an experienced naturalist. The enacted curriculum meshes the kindergarten readiness requirements from the public school district with the natural resources from the sanctuary. There has been a waiting list of students each year wanting to enroll in the program. Plans are currently underway to double the size of the program, and parents have been asking the school district to develop a nature-based track through the K-8 curriculum.

Keywords: Early childhood, community partnership, nature-based kindergarten, public school

> "There's no way that we can help children to learn to love and preserve this planet, if we don't give them direct experiences with the miracles and blessings of nature." – Anita Olds

Students in schools are expected to learn many things – e.g., subject matter concepts and ideas, how to get along with others, soft skills such as being punctual, and elements that will build character. For many years and in many settings, this learning was thought to be best learned indoors under the watchful eye of a qualified teacher. All students were expected to learn the same things at the same rate at the same time. However, as more is learned about how individuals grow and develop, questions have arisen about the assumptions related to learning that many educators have held dear for decades. What are the optimal conditions for learning? What roles do student misconceptions play in learning? How can free discovery play a role in learning? Should students go outside to learn? If so, how should their outdoor time be spent? Recent published research and the forest kindergartens of Europe were studied to address these questions and others like them to inform the planning and development of our program.

The Problem

In his widely-read book, *Last Child in the Woods* (2008), Richard Louv describes the impact of nature-deficit disorder on children – the increasing divide between youngsters and the natural world. He explores the environmental, social, psychological, and spiritual implications of the growing number of children who spend little time outdoors. Studying nature in its own setting at its own pace is something fewer and fewer children do. This is leading to a reduced understanding of our natural world. Instead of spending time outdoors, more children spend their free

time in front of a screen – be it video game, tablet, movies, or countless cable TV channels. These fast-moving, action packed forms of entertainment are more appealing to many than the slower, more peaceful pace of nature. However, the impact of all this screen time is not well understood with respect to academic, physical, emotional, and social development. There does seem to be a connection between the sedentary lifestyle that watching a screen supports and childhood obesity. The percentage of American preschool children who are overweight more than tripled between 1971 and 2009, exploding from 5.8% in 1971 to 18.4% in 2009 (Ogden, Carroll, Kit, & Flegal, 2014; Anderson & Whitaker, 2009). Six out of ten of these preschoolers will continue to be overweight or obese at age 12 (NICHD, 2006).

It has been shown that exposure to natural environments improves children's cognitive development by improving their awareness, reasoning and observational skills (Pyle, 2002). Early experiences with the natural world have been positively linked with the development of imagination and the sense of wonder (Cobb, 1977; Louv, 1991). Wonder is an important motivator for lifelong learning (Wilson, 1997). When children play in natural environments, their play is more diverse with imaginative and creative play that fosters language and collaborative skills (Taylor, Wiley, Kuo, & Sullivan, 1998; Fjortoft, 2001; White, 2014). Children who play regularly in natural environments show more advanced motor fitness, including coordination, balance and agility, and they are sick less often (Fjortoft & Sageie, 2000). Nature helps children develop powers of observation and creativity and instills a sense of peace and being at one with the world (Crain, 2001). Natural environments stimulate social interaction between children (Bixler, Floyd, & Hammutt, 2002). Outdoor environments are important to children's development of their personal identity (Broadhead & Burt, 2002). Nature buffers the impact of life's stresses on children and helps them deal with adversity. The greater the amount of nature exposure, the greater the benefits (Wells & Evans, 2003). For example, children with symptoms of Attention Deficit Hyperactivity Disorder (ADHD) are better able to concentrate after contact with nature (Taylor, Kuo, & Sullivan, 2001).

Thus, there is ample evidence that being outside, exploring natural areas, and interacting with plants, animals, and abiotic elements (e.g., rocks, soil, wind, rain, etc.) can benefit children in multiple ways. Yet these experiences are being replaced by more appealing indoor activities, or the push for more academics to be added to the kindergarten experience, in particular preparing students to read (Sparks, 2014). What can be done to get more children outdoors and help them and their families realize that there is much to be learned while having a good time?

Lessons from Europe

One way to address the issues described in the previous section is for children to attend a *forest kindergarten* (waldkindergarten in Germany). This type of early childhood education, typically for youngsters aged 3-6, is held almost exclusively outdoors. Children are encouraged to play, explore, and learn in all kinds of weather in a forest or other natural environment. Adults organize lessons not through highly structured activities, but through assisting students in their learning, using their natural curiosities and exploration as the foundation. The emphasis is on play with toys fashioned from natural objects, such as sticks, small rocks, hardened mud, grasses, etc. Common activities include playing imaginative games, role playing, building structures, counting objects, looking for patterns, and memory games, all with natural materials found in the local environment. Even though many differences exist in the methods between forest kindergartens and school-based kindergartens, the ultimate goal of educating young children remains the same.

Forest kindergartens are most common in Scandinavia, Germany, and the United Kingdom. The work of a variety of theorists, including Jean-Jacques Rousseau, John Heinrich Pestalozzi, Friedrich Froebel, John Dewey, Maria Montessori, Jean Piaget, and Lev Vygotsky, have influenced the creation of seven pedagogical principles of practice that guide the forest kindergarten approach to education (as described by Williams-Siegfredsen, 2012):

1. A holistic approach to children’s learning and development
2. Each child is unique and competent
3. Children are active and interactive learners
4. Children need real-life, first-hand experiences

5. Children thrive in child-centered environments
6. Children need time to experiment and develop independent thinking
7. Learning comes from social interactions.

Among the theorists listed above, Froebel is widely credited with establishing the first kindergarten in Germany in 1837. His background in forestry and his strong belief that child-led, nature-based experiences should be the core of early childhood education continues to influence programs today in many countries. Many positive outcomes, both academic and in other domains, are attributed to this approach.

Underpinning the Danish forest school approach is the research indicating that using the outdoor environment and allowing children to be outdoors all year round is beneficial. It not only develops children's physical, cognitive, linguistic, social and emotional competencies, it also keeps them healthy. The research is showing that children who spend a significant amount of time outdoors each day have better social skills, are more attentive, have fewer infections, have fewer conflicts, have better brain function, have better language development and learn more vital life skills than those spending more time indoors. (Williams-Siegfredsen, 2012, p. 13)

In 1993, the forest school concept was transported to England from Denmark following an exchange visit by staff at Bridgewater College in Somerset, and approximately 50 forest schools have been established across Great Britain since (Maynard, 2007). Fostering self-esteem, developing self-confidence, creating independence, learning about the environment, and taking risks have been foregrounded in these programs. Of particular importance is for students to meet both physical and emotional risks and challenges head-on – climbing a tree, balancing on a log, jumping into a pond, etc. It is critical that children learn how to assess risks and take challenges to not only spur on their development, but because these are crucial life skills. The adult's role is to support and guide the students in how to assess challenges and risks for themselves. The setting is made as safe as reasonably possible, in order to facilitate risk-taking. Trust among students and between an individual student and teacher is central to many components of a forest school (Constable, 2014; Knight, 2013).

Translating the European Ideas to Our Program

The nature-based approach to early childhood education has grown rapidly in the United States in the past five years. According to North American Association for Environmental Education (2017a), there were at least 250 nature preschools and forest kindergartens operating in 43 states in 2017 compared to fewer than 50 in 2012. The OAK (Outdoor Adventures for Kids) Learning Center at the Bay Beach Wildlife Sanctuary in Green Bay, WI admitted its first classes of students during the 2013-14 academic year. Much of the planning for this program was informed by the ideas from Europe that were just described. Thus, the OAK Learning Center is part of a swiftly growing network of like-minded organizations and individuals. This network is a valuable resource in the advancement of this program when considering the benefits of environmental education for learners, including "improving academic performance, enhancing critical thinking skills, and developing personal growth, life-building skills, confidence, autonomy, and leadership" (North American Association for Environmental Education, 2017b, p.2).

OAK Learning Center students are chosen for this program using the same procedures that govern the enrollment of all 29 four-year-old kindergartens in the Green Bay Area Public School District. It was the first nature-based four-year-old kindergarten (4K) program in Wisconsin connected with a public school district, and it remains the only nature-based 4K program in the Green Bay school district. A handful of other nature-based 4K programs exist within the state, but all are either private schools, Montessori schools, or charter schools. Our goal was to offer a tuition-free program.

Figure 1. Students practicing their balance on a downed tree under the supervision of two adults

As in many states, four-year-old kindergarten is not mandated, but many school districts are offering it, which creates a shortage of classroom space. A statewide model has been developed whereby a public school district can partner with another organization (such as a non-profit) which has classroom space, allowing the district to offer 4K without having to build additional classrooms. The state educational reimbursement per student is split between the school district and the 4K site. The non-profit organization uses this funding to hire instructional staff (in this case a certified teacher and an experienced naturalist) and purchase educational materials. Lessons are team taught by the teacher and naturalist, which allows access to two different areas of expertise (early childhood and environmental education) in the curriculum. The school district furnishes the classroom and equips the staff with other needed materials, in addition to providing professional development opportunities, evaluation of the teaching staff, etc. Since the funding comes from the State, tuition is not charged to families, making it affordable to everyone, which was a core consideration in the formation of this program. During the planning years, visits to other nature-based preschools included discussions of the barriers for participation by some families. Tuition was one of the barriers, and the commitment was made to find a model that would not require a family to pay tuition thereby opening this opportunity to many families who live in the economically strained neighborhoods near the sanctuary.

In addition to the Green Bay school district and the wildlife sanctuary, the city of Green Bay is a partner (since the sanctuary is a city park) along with the local university (the University of Wisconsin-Green Bay). The teacher and naturalist are actually city employees, and the University provides expertise and experience with environmental education programming along with field placements for early childhood pre-service teachers and interns. The development of this partnership during the 2012-13 academic year has been a strength of this program, with each partner using the OAK Learning Center to fulfill both philosophical goals and pragmatic programmatic needs. Many meetings occurred prior to the enrollment of any students to ensure that the needs of each partner were being met

and that the goals of the program were consistent with the overarching goals of each partner. The following table summarizes the important goals and needs that have been addressed.

Table 1: What goal or need has the OAK Learning Center helped each partner meet?

Partner	Philosophical Goal	Pragmatic Need
Green Bay Area Public School District	A customized learning track for each student is offered. The OAK program is the beginning of an environmental education track.	More 4K sites are needed for an increasing enrollment.
Bay Beach Wildlife Sanctuary	Environmental education is part of its mission. This program provides an opportunity for young children to begin early in developing an appreciation for and understanding of nature.	One objective is to increase enrollment in the sanctuary's programming.
University of Wisconsin-Green Bay	Establishing more collaborations with community organizations is a priority of the new administration of the campus	The OAK program provides a field placement for pre-service teachers and a site for research studies concerning early childhood development.
City of Green Bay	The OAK program adds one more reason (a strong education system) why a family might choose Green Bay as a place to live.	The program provides an employment opportunity for a teacher and naturalist.

Many of the specific components of a forest kindergarten described in the previous section have been incorporated into the OAK Learning Center. A building exists at the sanctuary where students seek shelter during extreme weather conditions. This building also has restroom facilities, an area for snack time, and office space for the teacher and naturalist to perform administrative duties. Children are expected to be dressed for the weather when they arrive for their class. A motto regularly shared with parents is, "there is no such thing as bad weather, only bad clothing," which comes from the European programs. The guiding philosophy for the curriculum is *purposeful play* that pays attention to the students' academic, physical, social, and emotional development. Purposeful play has a meaning behind it; the student has a reason for why he or she is doing what she or he is doing. For example, when a student is building a structure out of sticks, she might say that she is building a home for an animal, and, as she is doing so, she is learning engineering principles. When a student is balancing on a log as part of a story he is telling to his friends, he is acting out what an animal might be doing, while also learning how far he can lean one way or the other before losing his balance. Subsequently, he might learn that by lowering his center of gravity while balancing on a log, he can lean out further before losing his balance. Careful observation of these student behaviors on the part of the teacher and naturalist informs future lessons and allows the instructors to gauge the developmental readiness of the students for more advanced activities.

There are 20 children enrolled in a three-hour morning section with another 20 students attending an afternoon session. As with other 4K programs in the school district, parents/guardians must provide transportation for drop-off and pick-up, so the program is limited to those students from families with this resource. Innovative ways to provide transportation to families who need it are continually being explored so that this barrier to participation can be removed. However, student enrollment mirrors the demographics of the northeast side of the city where the sanctuary is located, with respect to race/ethnicity, socioeconomic background, and single-parent households.

Figure 2. At the OAK Learning Center, there is no bad weather, only bad clothing.

Each class is taught by a certified early childhood teacher and an experienced naturalist who are hired through the city. Appropriate teaching strategies and assessment practices are created and implemented by the teacher while the naturalist provides many ideas and experiences for the students to interact with the big ideas and concepts related to the environment. This instructional approach is based on ideas from the past few decades when it became evident that many teachers were uncomfortable with taking their students outdoors due to their lack of knowledge about the environment (Hanna, 1992; Kellner, 1975). When planning lessons, the teacher is responsible for making sure the district curriculum and assessment standards are being met, and the lessons are taught in a developmentally appropriate manner. The naturalist makes certain the content of what is being taught is accurate and is a valuable resource for both the teacher and students as they explore the natural areas of the sanctuary during lessons.

Children are immersed in the natural world to learn *in-nature* versus learning *with-nature* (Warden, 2012). The program does more than just add nature to a playground, use a natural playscape, have students make observations out the classroom window, or read a nature-based story, which are all examples of learning "with-nature." Digging in the earth, looking for bugs, balancing on logs, jumping in puddles, singing songs, building fires, catching fish, planting a garden, observing wildlife on a nature walk, and rolling in the mud help ensure the "in-nature" learning experience.

Figure 3. The outdoor exploration space includes hollow logs, rocks, and a storage shed in a fenced area.

Measures of Success

Has this program been successful during its first few years? The following are several measures that would indicate it has been.

Academic performance. The PALS (Phonological Awareness Literacy Screening) assessment, developed at the University of Virginia, is administered twice per year in this program. According to the teacher, almost all of the students have been at or above the expected level of performance. Informal conversations with kindergarten teachers have yielded no concerns about the kindergarten readiness of OAK Learning Center graduates. Parents have also commented that their OAK graduate has met or exceeded the academic expectations of kindergarten and subsequent grades.

Waiting list. The OAK Learning Center is a "choice" program. Parents can choose to send their child to this program or have their child enroll in their "home school." Each year, this program has always been the first 4K program in the school district to fill enrollment, and by May 1, a waiting list has grown to more than a dozen students for the following fall. Students are placed on the waiting list using a lottery system from all applications, and the rank order from the lottery determines the order in which students are enrolled, if spaces open. Each year the district fields calls from parents of two-year-olds wanting to know how to get their child's name on the registration list for two years in the future. However, this option does not exist in the school district. (One year a mother who was only six months pregnant called to inquire about registration of her unborn child.)

Parent survey responses. At the end of each academic year, a graduation ceremony is held for the students. Parents, family members, and all stakeholders in the program are invited. We have taken this opportunity to administer a parent survey consisting of three items:

1. What are the strengths of this program? What does this program do well?
2. What needs to be improved or changed? Should something be eliminated? If so, what?
3. Overall, what is your evaluation of this 4K program?

For each year, the responses have been overwhelmingly positive (greater than 90% of all responses to item three are positive), with some parents not being able to come up with anything to write as a response to the second question. Recurring positive comments have included the hope that younger siblings will be able to attend the program, the amazement of the breadth and depth of knowledge learned during the year, the increased appreciation the student has for the natural world, and the monitoring the student does of family activity, such as making sure that recycling is occurring and that no one litters.

Interviews with parents and students. During an interview with a university reporter, one student exclaimed, "We were learning, and we didn't even know it!" Informal conversations with groups of parents have also yielded equally enthusiastic feedback. "My child is learning so much. He comes home nightly to explain to us why something happens the way it does." "I am learning a lot about nature just by talking to my child." Many parents responded that they wished their child could stay in the program for five-year-old kindergarten or all of elementary school. Because of the success of this program, the school district is reorganizing one of its elementary schools as a science, technology, engineering, and mathematics (STEM) school with an environmental focus.

Interviews with other stakeholders. After the first year, representatives from each of the partners were interviewed. Once again, positive comments dramatically outweighed the occasional suggestion for improvement. "This program has been an invaluable addition to the array of early childhood programs offered in the area." "Using the OAK Learning Center as a field placement site for teacher candidates has allowed these pre-service teachers to experience a unique approach to teaching and learning from what they see in a regular classroom." In fact, the program has been so successful that fund raising efforts are underway by the friends group of the sanctuary to expand the facilities at the site, allowing for the program to at least double in enrollment.

Anecdotal evidence. Although we do not have any statistically rigorous data to support these statements, some parents have claimed that their child lost weight during the program. The teacher and naturalist observed an increase in student stamina on hikes during the school year. The parent of a child with special needs noticed her daughter's flexibility, balance, and stamina improve as a result of the physical activities at the program.

Conclusion

This program has been deemed successful from multiple perspectives, as have other nature-based preschools. OAK Learning Center students develop not only academically by learning numbers, letters, shapes, colors, etc., but also physically, socially, and emotionally. When observing lessons, it is highly evident that the students are having fun while learning. They are balancing on logs and taking long nature hikes. They are working together to complete complex tasks. They are developing deep and lasting connections to nature. When older students come to the sanctuary for a field trip, the OAK students can sometimes be seen explaining to them how to properly treat animals (e.g., don't chase geese) and respect the environment (e.g., pick up your litter). They are becoming true ambassadors for the natural world. All of these outcomes were made possible through the creation of a nature-based early childhood program built from a partnership of organizations and using the lessons learned from other successful programs. We hope that our program can help inform others as well.

References

Anderson, S.E. & Whitaker, R.C. (2009). Prevalence of obesity among U.S. preschool children in different racial and ethnic groups. *Archives of Pediatric and Adolescent Medicine, 163*(4), 344-348.

Bixler, R.D., Floyd, M.E. & Hammutt, W.E. (2002). Environmental socialization: Qualitative tests of the childhood play hypothesis. *Environment and Behavior, 34*(6), 795-818.

Broadhead, P. & Burt, A. (2012). *Understanding young children's learning through play: Building playful pedagogies*. London: Routledge.

Cobb, E. (1977). *The ecology of imagination in childhood*. New York: Columbia University Press.

Constable, K. (2014). *Bringing the forest school approach to your early years practice*. London: Routledge.

Crain, W. (2001, Summer). How nature helps children develop. *Montessori Life*.

Fjortoft, I. (2001). The natural environment as a playground for children: The impact of outdoor play activities in pre-primary school children. *Early Childhood Education Journal, 29*(2), 111-117.

Fjortoft, I. & Sageie, J. (2000). The natural environment as a playground for children: Landscape description and analysis of a natural landscape. *Landscape and Urban Planning, 48*(1/2), 83-97.

Hanna, G. (1992). Jumping deadfall: Overcoming barriers to implementing outdoor and environmental education, presented at the International Conference for the Association for Experiential Education, Banff, Alberta, Canada, October 8-11, 1992.

Kellner, R. (1975). *To catch a falling star: Environmental education implementation strategy handbook*. Washington, DC: Bureau of Elementary and Secondary Education.

Knight, S. (2013). *Forest school and outdoor learning in the early years*. (2nd ed.). London: Sage.

Louv, R. (2008). *Last child in the woods: Saving our children from nature-deficit disorder*. New York: Workman Publishing.

Louv, R. (1991). *Childhood's future*. New York: Doubleday.

Maynard, T. (2007). Forest schools in Great Britain: An initial exploration. *Contemporary Issues in Early Childhood, 8*(4), 320-331.

National Institute of Child Health and Human Development (NICHD). (2006). *The NICHD study of early child care and youth development: Findings for children up to age 4 ½ years.* Washington, DC: U.S. Department of Health and Human Services.

North American Association for Environmental Education (NAAEE). (2017a). *Nature preschools and forest kindergartens: 2017 national survey*. Washington, DC: NAAEE.

North American Association for Environmental Education (NAAEE). (2017b). Stanford analysis reveals wide array of benefits from environmental education. Washington, DC: NAAEE. Available at https://cdn.naaee.org/sites/default/files/eeworks/files/k-12_student_key_findings.pdf

Ogden, C.L., Carroll, M.D., Kit, B.K. & Flegal, K.M. (2014). Prevalence of childhood and adult obesity in the United States, 2011-12. *The Journal of the American Medical Association, 311*(8), 806-814.

Pyle, R. (2002). Eden in a vacant lot: Special places, species and kids in community of life. In Kahn, P.H. and Kellert, S.R. (Eds.) ,*Children and Nature: Psychological, Sociocultural and Evolutionary Investigations*. Cambridge, MA: MIT Press.

Sparks, S.D. (2014, February 5). Study finds reading lessons edging out kindergarten play. *Education Week,* p. 5.

Taylor, A.F., Kuo, F.E. & Sullivan, W.C. (2001). Coping with ADD: The surprising connection to green play settings. *Environment and Behavior, 33*(1), 54-77.

Taylor, A.F., Wiley, A., Kuo, F.E., & Sullivan, W.C. (1998). Growing up in the inner city: Green spaces as places to grow. *Environment and Behavior, 30*(1), 3-27.

Warden, C. (2012). *Nature kindergartens and forest schools: An exploration of naturalistic learning within nature kindergartens and forest schools*. Crieff, Scotland: Mindstretchers.

Wells, N.M. & Evans, G.W. (2003). Nearby nature: A buffer of life stress among rural children. *Environment and Behavior, 35*(3), 311-330.

White, J. (2014). *Playing and learning outdoors: Making provision for high quality experiences in the outdoor environment with children 3-7.* (2nd ed.). London: Routledge.

Williams-Siegfredsen, J. (2012). *Understanding the Danish forest school approach: Early years education in practice*. London: Routledge.

Wilson, R.A. (1997). The wonders of nature: Honoring children's ways of knowing, *Early Childhood News, 6*(19).

Scott Ashmann is Associate Professor of Science Education at the University of Wisconsin-Green Bay, USA. He can be reached at ashmanns@uwgb.edu.