

# NATURE EXPERIENCE AND EDUCATION

by Kevin Rathunde

*Kevin Rathunde turns his research lens to the task of finding out the relevance of the natural world, its impact on adolescent motivation, and its positive sustaining of concentration and focus. He cites “disembodiment and denaturing” as needing to be countered by contact with nature, leading to higher creativity, less drudgery, and more positive social interaction for an adolescent community.*

Today I’m going to talk about nature experience and education. It’s a new research topic, but hopefully some of the connections to my previous study on flow and Montessori education will become obvious as I go along. I again feel like a kindred spirit with Montessorians, but this time connecting on the idea of nature. I’m excited about the prospect that Montessorians have something important to communicate to the outside world on this topic.

Here’s a brief outline of what I’m going to talk about today. First, I’m going to discuss why it’s important to study nature and education. Next, I’ll talk a little bit about what Montessori had to say about the importance of nature. Finally, I’ll give you a very general idea about a possible new study. This work is still in the formative process; I would love feedback and some of your ideas for conducting new research.

So why do research on nature and education? Let me start with why such research would have personal relevance. Then I’ll get to some of its theoretical relevance. I accepted a job at the University of Utah partly because of experiences that I had in nature. I love the desert and the mountain environments in Utah, I love to hike in the canyons, and that was certainly one of the reasons I moved there. Also, when I was a student at the University of Chicago, right before I took my job at Utah, I bought a book called *The Experience of Nature* (Kaplan and Kaplan). It’s been in the back of my mind to do this kind of research for a long time. So this is also something I’m very excited to do.

As for theoretical relevance, I want to mention three reasons why research on nature and education is important. The first reason would be our biological connection to nature. Many of you may have heard

of the notion of *biophilia*, introduced by Edward O. Wilson, which basically says that, because of our evolutionary past, over thousands and thousands of years in connection with nature, we have developed an affinity with nature. We’re prepared to learn about and even have preferences for certain kinds of natural environments because of our evolutionary past. Here is a related quote from Abraham Maslow, which I’ve been using in some of my Theories of Human Development classes for over ten years. This was written in the late 1960s, before the biophilia concept, and it says the same thing:

Perhaps [man’s] thrilling to nature . . . will someday be understood as a kind of . . . biological authenticity. . . . Here the “highest” experience ever described, the joyful fusion with the ultimate that man can conceive, can be seen simultaneously as the deepest experience of our ultimate personal animality and specieshood, as the acceptance of our profound biological nature as isomorphic with nature in general. (333)

What I see Maslow saying is that our highest transcendent experience, the kind of feeling I have in the canyons of Utah, being connected to something outside of myself, something higher, and that feeling of awe and wonder, is at the same time part of our animality, part of our biology. And I think Maria Montessori understood this as well.

A second reason, and I know you will all agree with this, is that there’s a de-naturing of childhood going on. There’s too much disembodied knowledge. We’re disconnecting hand from head in a lot of schools. And there’s a kind of second-hand experience through television, through video games, rather than primary experience in the environment. It’s very distressing. Here are a couple of quotes from people that a lot of Montessorians know and

respect. David Orr comments, “The civilization we have built causes us to spend ninety-five percent or our lives indoors, isolated from nature” (204). David Hutchison adds, “As our artificial transformation of nature advances, our presence to nature declines” (xiii). So, as I said, there’s a de-natured, a disembodied aspect to student experience that I think diminishes knowledge and learning in schools.

The third thing that I would say about why it is important to study nature and education is that even though we have this biological connection and we’re living at a time where we’re disconnecting ourselves from nature, right now there’s hardly anything about this dilemma in educational policy. I’m not talking about Montessori and Montessorians, who have seen this connection, but in broader educational policy, there’s not much written, there’s not much research. So I think now is a good time to be thinking about doing research on nature in an educational context.

So what does science have to say about the benefits of nature? There’s some really interesting research out there, and I think you might be surprised by some of this. There are a lot of anecdotal reports in wilderness therapy suggesting that challenging experiences, being out in the wilderness, is good for self-esteem and competence. There are dozens and dozens of studies that say nature experience leads to positive affect—and even when you show people slides of beautiful environments, it picks up their moods. There are studies in medical journals about nature and the reduction of stress. Some doctors are getting involved and saying that we’re forgetting about the environment and how important the environment is to health. Other studies I read were very surprising. Just having a green view is related to a number of positive outcomes. Recovery from surgery is faster when you have a green view. If you have a mural on the wall in the dental office, there are lower levels of stress. In prisons, if prisoners had a green view, they had fewer visits to the infirmary. And with homes as well, children who move from apartment buildings to greener environments show an improvement in their cognitive functioning. Some studies with children show that in green environments they are less aggressive, more social, and have better social interaction.

All of these studies suggest that a greener environment would be healthy for students. But I still

don’t think we’ve nailed down what is specific to education and what is specific to Montessori. I think we all would agree that less stress and positive affect are good for students, but let’s try to narrow it down to education a little bit more. So let’s talk about Montessori.

Here is a quote from Maria Montessori that I think is consistent with the Maslow quote mentioned earlier and the notion of biophilia: “There is no description, no image in any book that is capable of replacing the sight of real trees ... in a real forest. Something emanates from those trees which speaks to the soul, something no book, no museum is capable of giving” (35). What I love about this quote is that she’s talking about the limitations of images in a book, and I think this applies to our increasing reliance on media images as well. What is missing is primary, direct experience. Montessori clearly recognized the educational importance of the direct experience of nature.

You all know better than I the connections to nature in Montessori’s writings, but here are two additional ideas where I think she was ahead of her times. First, she suggested that joy, wonder, and the experience of nature in childhood would lead to lifelong learning as an adult. A child was more likely to become an advocate for and a protector of the environment on the basis of this kind of experience. A second important idea is that sensorial experience provides a base for abstract thought. There is a lot of really interesting thought in philosophy right now on “embodied knowledge,” or how abstract knowledge is an extension of our sensory experience. And I think Montessori understood this: Nature and the infinite variability of sensory experience provide an essential foundation for abstract thought.

Both of these are very important ideas, but they are also hard to study. I would have to do a longitudinal study to look at the connection from childhood to adulthood in terms of these outcomes. But I have a general idea for a new study that is more practical and better connects to the research I just completed. Believe it or not, there’s research that suggests that nature has a positive effect on concentration and attention. This finding provides a potential bridge to my last study on flow and education. In other words, the reason the flow perspective provided such a good fit with Montessori philosophy was the shared belief that deep concentration, or flow, was essential for



Courtesy of Erin DeVries, Annie Fisher Montessori Magnet School, Hartford, Connecticut

education. There are many indications that nature actually has a positive effect on concentration.

I've looked at about ten studies already that have done pretty good research on how nature improves attention and concentration. Let me give you a little background before I tell you about some of the studies. The research, in general, is looking at what some call mental fatigue, which is exactly what you would get if you sit all day long, if you're concentrating, using directed attention, which means you have to focus and block out competing stimuli. That's a hard thing to do without any kind of break. Sometimes you need to use other kinds of attention, which I'll get to in a second, before you can really get your focus back. So that's the theory underlying this research. It actually comes from William James, whose work is also relevant to the flow perspective.

What others find is that nature has a restorative effect on concentration. Nature engages a different kind of attention that's more automatic and effortless, a kind of calm, focused observation that restores the ability for directed and selective

attention. It is called attention-restoration theory. One group of researchers studied individuals who went on backpacking trips or nature walks versus those who participated in different kinds of recreational or resting activities. After their activities, the study participants were given cognitive tasks in proofreading, and the proofreading scores were better after the nature experience.

Other studies have looked at the greenness of preschools and children's ability to focus attention. There seemed to be benefits for attention deficit hyperactivity disorder, again showing that kids had a greater ability to focus when they were in a greener preschool environment. Breast cancer survivors—right after surgery there's a great demand on attention, and the ability for selective attention tends to decline because of all the stress. In controlled studies, when they integrated nature activities in some groups versus others, the selective attention, the ability to focus and concentrate, improved in the breast cancer survivors who integrated nature activities. Some researchers have done studies on the dorm room views of college students and found that a green view improves students' attention and concentration. There has also been a bit of physiological research—although not much—suggesting that nature evokes brain waves more characteristic of calm and focused states of attention.

This is an area where I think we can influence educational policy in the sense that no one would deny the importance of concentration and the ability to focus attention in school. I think we are undermining learning in schools that are cutting out recess, in schools that are saying, "We are so worried about evaluation and testing that we need to cut out what's frivolous and just really focus on academic tasks." Education needs to have the balance we've been talking about today at the conference: Students need the regeneration of energy that comes from the alternation of different kinds of activities. One way to get this regeneration is with the integration of nature with school-related intellectual activities.

I start from the assumption that mental fatigue and drudgery are ruining many schools and resulting in disembodied education. And I want to show you an example of this from the flow study we just finished. As you know, we looked at five Montessori schools and compared them to six demographically



Courtesy of Scripps Montessori School, San Diego, California

matched traditional schools, so these kids were all in similar-sized classes and had parents who had similar amounts of education. We used the Experience Sampling Method. Two research articles were just published in good education journals (Rathunde and Csikszentmihalyi, "Middle School Students' Motivation"; Rathunde and Csikszentmihalyi, "The Social Context").

This is my favorite finding from the study. We used a measure of experience that we called "important but not motivating." It's when students are saying they're concentrating and focused on what's going on in the school environment, but they're not enjoying it, they're not in a good mood, they're not motivated at all. This is what is meant by mental fatigue and drudgery. It's concentrating without the sense of emotional connection, without some sense of motivation. We found a big difference: Montessori students spent four hours less a week than traditional students having this kind of experience.

Now what were the reasons for this? In the research articles we talked mostly about the classroom context, things like having supportive teachers, free choice, and positive interaction with peers. But I think nature experience, and the integration of the natural environment, may be part of the answer here, too, for elimination of this kind of drudgery.

So, what I'd like to do is study how nature experience can heal drudgery and mental fatigue and lead to better concentration and a higher quality of student experience. One possibility would be to introduce a task, maybe a creative task, and then have a couple of conditions: a nature experience condition and a control condition. Outcome measures might look at students' experience, concentration, and creativity during the task. Another possibility is to do something more ethnographic and qualitative. This would involve talking to the students and getting them more directly involved in the research as participants. Both are still options that I am considering

The final thing I'd like to do today is to try and convince you to help me with this research. This study will not be like the last one. The last one was a little bit like "Montessori versus . . ." and "Montessori is better than . . ." Whatever the form of the new study, it is not going to be about comparing Montessori schools to traditional schools. However, I think you should get involved for this reason: Maria Montessori was very much ahead of the times with her ideas about nature and education. Only now are people starting to realize the kind of civilization we've created that instigates a de-naturing, disembodied process where kids are primarily having secondhand experiences. There are now more people talking about the design of schools and the integration of greenness into the environment. I think a new study would come at an opportune time, and, just like the last study, where I could argue that Montessori was an existing culture that actually was living what other people were talking about as reforms, I think the same thing could be said about the integration of nature. Montessori is an existing culture that already recognizes the importance of nature for education and could be a model for looking at how to reform schools. So that's my pitch for you to give me some ideas and maybe, if I get a grant, to invite me back into your schools. Are there any questions [from the audience]?

*Q. It occurs to me that there is continuing pressure on Montessori schools to de-nature their environments and place more emphasis on academic performance and academic outcomes, and there's a growing need for a body of work that substantiates and rationalizes the outdoor experience as being just as beautiful and just as productive and, in fact, as being a necessary prerequisite to academic performance. From our perspective,*

*internally, we need those kinds of research and tools to help our parents better understand the value.*

A. Yes, that would be a way that would also serve the Montessori community. Well, that's great to hear, because what better outcome variable could you think of than this kind of engagement and concentration? You need focused attention for learning, no one would deny that, so if you can show that the integration of the natural environment and these kinds of experiences are important for that outcome, it makes a powerful argument, and you actually are undermining learning by trying to expect nonstop concentration.

Q. *If you have to overcome the anti-New Age bias, bring up people like Locke and Rousseau and Thoreau—that's all part of our tradition in this country, as innovative thinkers, this whole need for that hands-on nature experience.*

A. Right. And there are a lot of wonderful anecdotes of creative individuals who have had insights in nature. In interviews that I did for Csikszentmihalyi's creativity study, Linus Pauling talked about moving rocks around in his garden as an interlude in his work. The eminent historian William McNeil talked about chopping wood as an interlude in his creative work. So I heard it all the time in the creativity setting as well.

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## REFERENCES

- Hutchison, David. *Growing Up Green*. New York: Teachers College Press, 1998.
- Kaplan, Rachel & Stephen Kaplan. *The Experience of Nature: A Psychological Perspective*. New York: Cambridge University Press, 1989.
- Maslow, Abraham. *The Farther Reaches of Human Nature*. New York: Viking, 1971.
- Montessori, Maria. *From Childhood to Adolescence*. 1948. Trans. The Montessori Educational Resource Center. Madras, India: Kalakshetra, 1973.
- Orr, David. *Earth in Mind*. Washington, DC: Island Press, 1994.
- Rathunde, Kevin & Mihaly Csikszentmihalyi. "Middle School Students' Motivation and Quality of Experience: A Comparison of Montessori and Traditional School Environments." *American Journal of Education* 111.3 (2005, May): 341-371.
- Rathunde, Kevin & Mihaly Csikszentmihalyi. "The Social Context of Middle School: Teachers, Friends, and Activities in Montessori and Traditional School Environments." *The Elementary School Journal* 106.1 (2005, September): 59-79.

