

Environmental Knowledge And The Connection To Nature Are Both Associated With Ecological Behaviour And Environmental Attitude

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Abstract

Few controlled studies have examined the effect of nature-based training on environmental activism; hence the results are unclear. This makes it hard to draw conclusions about what caused what and provide suggestions for solutions. The study's authors detail the findings from an experiment that assessed the impact of a "nature-based environmental education (NBEE)" course on students' environmental attitudes (EA) & behaviours (EB). The children in the control group were also part of the course, but they continued with their regular schooling. Seven elementary schools in Spain were involved in the initiative. Classes were assigned at random to either the NBEE course or the traditional "environmental education (EE)" programme at each school. Our research shows that compared to the control group, the NBEE group had much higher increases in children's EA levels. In both groups of kids, the average prevalence of EB remained rather stable over time. Our findings support the idea that formal education programmes might benefit from including a nature-based pedagogy in their curricula to help shape students' environmental consciousness.

Keywords: *Nature Environmental Education, Environmental Attitudes, Environmental Behaviour, Environmental knowledge.*

INTRODUCTION

More and more people are starting to see how bad humans are for the planet. An awareness of what motivates individuals to behave in an environmentally conscious manner—their "pro-environmental attitudes" or "EB"—is crucial for finding solutions to environmental problems (Del Rey et al., 2022). EA is defined as "the sum of a person's views, emotions, and plans for how they will act with environmental concerns or activities," while EB is the deeds that help keep the natural world habitable (Collado & Evans, 2019).

The importance of environmental education (EE) in changing people's mindsets and actions to be more sustainable cannot be overstated. The conventional wisdom is that EE may improve EA and EB more effectively than incentives and penalties, two examples of extrinsic motivators. In the past, environmental education has mostly concentrated on teaching people the whys and how's of environmentally conscious behaviour (Jordan & Chawla, 2019). When it comes to predicting EB, knowledge doesn't appear to matter much. What does matter, however, are other qualities like having an emotional connection to nature & having pro-environmental values, which are more strongly linked to taking action that benefits the environment. While most subjects may be taught in or out of a classroom, EA & EB are notoriously tough to master in a traditional setting (Collado et al., 2020). Therefore, a number of academics have suggested that spending time in nature may improve EA & EB, and they are advocating for this practice to be included in EE programmes. Previous research has looked at how children's EA and EB change after spending time in nature, but most of these studies have been retrospective or based on correlations, so it's hard to draw any firm conclusions about cause and effect. Because of this, it will be more difficult to provide environmental educators and other stakeholders with detailed instructions. So, there's been a new push for controlled research to learn more about how kids' exposure to the outdoors influences their

environmental attitudes (Rosa & Collado, 2019). First, in response to this request, researchers report the results of a "true experiment" (a randomised controlled trial) that looks at how an environmental education programme that focuses on nature affects the EA and EB of elementary school students. The goal of the NBEE programme was to supplement the traditional academic curriculum with chances for students to engage in hands-on learning in natural settings. Researchers want to compare the results of teaching the same material in a more conventional way (i.e., inside, without exposure to nature) with those of incorporating an NBEE programme into the school science curriculum and seeing how it affects students' emotional regulation and emotional growth (Otto et al., 2019).

1. BACKGROUND OF THE STUDY

The significance of "nature-based environmental education (NBE)" in influencing children's ecological behaviour and attitudes has been more acknowledged throughout its history. Naturalists like John Muir and Aldo Leopold, who worked in the late 19th and early 20th centuries, laid the groundwork for NBE by highlighting the importance of firsthand encounters with the natural world. In their works, they emphasised the need to develop a strong connection with nature, arguing that doing so may inspire people to take environmental protection seriously (Collado & Sorrel, 2019). Formalisation of these concepts into educational frameworks was encouraged by the contemporary environmental movement in the 1960s and 1970s. The foundation of Earth Day and the seminal text *Silent Spring* by Rachel Carson brought attention to the critical need for environmental education. Joseph Cornell & David Sobel, two prominent educational theorists of the time, started to push for experiential learning methods, which emphasised the need for students to have outside, hands-on experiences for them to comprehend environmental concerns (Otto & Pensini, 2017). Scientific evidence on the value of outdoor education started to pile up in the '80s and '90s. Research shows that kids learn a lot about the environment and form good habits when they spend time in nature regularly and that this knowledge leads to greater conservation efforts. Programmes that included these results sought to promote environmental literacy by mixing ecological science with outdoor adventure. One such program was created by the "North American Association for Environmental Education (NAAEE)" (Bhola et al., 2022).

Currently, NBE is still developing, with an emphasis on comprehensive methods that integrate environmental understanding with human ties to the natural world on an emotional and psychological level. Sustainable ecological behaviours and good attitudes towards the environment can only be fostered via a deep connection with nature, according to recent efforts backed by studies in cognitive science and environmental psychology. So, NBE is still an important part of making sure the next generation is environmentally sensitive (Zhang et al., 2019).

2. PURPOSE OF THE STUDY

Investigating "The Impact of Nature-Based Environmental Education on Children" aims to find out how exposing kids to nature changes their perspective on the environment and how they behave in response to it. Its overarching goal is to deduce the mechanisms via which exposure to nature might cultivate environmental consciousness and goodwill. By shedding light on how studying in nature may lead to more sustainable habits, this study hopes to improve teaching methods and inspire students to become environmental stewards for the rest of their lives.

3. LITERATURE REVIEW

Numerous studies have shown that NBE has a positive effect on students' environmental literacy, values, and actions. According to studies, people are more likely to be environmentally conscious, have good attitudes, and engage in pro-environmental behaviours after having hands-on experiences in nature (Baird et al., 2022). A strong feeling of environmental stewardship is fostered by early, meaningful experiences with nature, according to one important study. Studies that contend that children's environmental attitudes and behaviours are adversely affected by their detachment from nature, frequently referred to as "nature deficit disorder," lend credence to this claim. A strong connection with nature may be fostered via outdoor, experiential learning, according to research (Pirchio et al., 2021).

Furthermore, studies show that kids who participate in nature-based learning activities regularly have better environmental knowledge and attitudes than kids who don't. Their research provides additional evidence that

learning about the environment in natural settings might inspire people to make better lifestyle choices (Sprague et al., 2020). "American Association for Environmental Education (NAAEE)" and similar programmes use nature-based ways to teach students about the environment and encourage them to become conservationists for the rest of their lives, drawing on these results. Many scholars have stressed the need to supplement environmental learning with meaningful outdoor experiences to foster a feeling of belonging and personal accountability. As a whole, the research shows that environmental education that takes place in natural settings has a significant impact on children's environmental attitudes and understanding, which are critical for encouraging environmentally responsible actions in the future (Acharibasam & McVittie, 2023).

4. RESEARCH QUESTION

- i. How to identify the effects of nature-based environmental education on children?

5. METHODOLOGY

Method and sampling: Throughout the trial, the Eco-organization contacted twenty state primary schools located in various geographical areas of Spain to ask about their interest in participating in the NBEE project. The list of schools was narrowed to seven due to the qualifying requirements, which encompassed the principal's or teachers' excitement for the curriculum, as well as the school's closeness to a readily accessible natural environment. The EE intervention was administered to the kids at the class level. Classes at the educational institution were assigned randomly to either the experimental group (N = 516, mean = 8.23, standard deviation = 1.71) or the waitlist control group (N = 218, mean = 9.47, standard deviation = 1.39, with 50% males). The mean score of the experimental group was considerably lower compared to the waiting control group. While the Eco-organization needed to carry out an empirical investigation to ascertain the impact of their NBEE programme on the environmental awareness (EA) and environmental behaviour (EB) of children, their main goal was to actively include as many children as possible from the beginning of the project. This is because administrators & instructors often encounter opposition while participating on a waitlist management committee. The allocation of students to each class was done randomly, with a ratio of 2:1 between the experimental group and the control group.

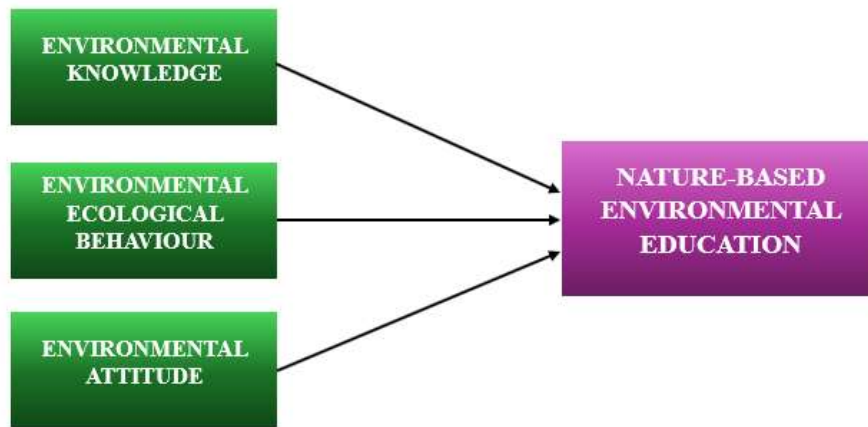
Data and Measurement: To learn about kids' perspectives on the environment, researchers used two different surveys. One of these assessments, the New Ecology Model scale, aimed to capture children's rational viewpoints on environmental issues, while the other, the Child Environmental Impressions Survey, sought to capture children's emotional reactions to environmental issues. These two instruments were used to document the environmental views of youngsters. This was done because previous studies have shown that people's emotional and mental attitudes play a significant role in deciding whether they are eco-conscious.

Evaluation Using the NEP As a Measurement Tool: The researchers administered the NEP scale in Spanish to the kids to gauge their environmental views. "If things don't change, researchers will soon have a large environmental disaster," is one of the eleven points that make up the document.

a) The sixteen-item Children's Environment Perspectives Survey measures children's views on nature, including their feelings towards it, their level of interest in it, and their comprehension of the benefits of being in natural environments. Results from a prior administration of Spanish youth demonstrated strong psychometric characteristics.

Statistical tools: Descriptive analysis was applied to understand the basic nature of the data. Validity and reliability were tested through three stepwise regression analyses.

5.1 Conceptual Framework



6. RESULTS

The descriptive data is shown in Table 1, which compares our T0 and T1 measures to those of a control group. Children had remarkable EA and reported high levels of engagement in EBs, on average. Table 1 displays the results of the three stepwise regression analyses that were conducted, one for each dependent variable. These analyses were used to determine if the EA or EB of the children vary when they are grouped according to their specific groups. Our findings suggest that, as compared to the control group's traditional education, the NBEE programme (the study group) significantly improves students' EA as measured by the NEP during the CEPS. That was established by contrasting the experimental group's educational approach with that of the control group, which opted for a more conventional approach. Even if the kids were put into different groups, this remained true. The CEPS post-intervention study found a mean difference of 0.24 between the control and experimental groups after accounting for the baseline mean. According to the CEPS, students' EA improved by 6% as a result of the NBEE initiative, as opposed to when the subject was taught conventionally.

After controlling for pre-intervention group means, researchers discovered an average difference of 0.32 in NEP scores between the experimental and control groups after the intervention. Thus, compared to those who went to sessions that followed conventional wisdom, NBEE programme participants had a 9% increase in their EA. All of this information came from the NEP. After accounting for the EBs reported before the start of the research, there was no significant difference between the trial group and the control group in terms of the EBs reported by the participants themselves after the intervention.

Table 1: pre- & post-intervention outcome indicators mean (SD), skewness, & kurtosis by group (experimental: N = 516; and control: N = 218)

Experimental Group				Control Group		
Pre-Intervention (T0)						
	Mean (SD)	Skewness	Kurtosis	Mean (SD)	Skewness	Kurtosis
CEPS ¹	4.07 (0.60)	−0.85	0.69	3.99 (0.64)	−0.91	0.65
NEP	3.71 (0.65)	−0.64	0.27	3.65 (0.59)	−0.48	0.34
CEP	3.91 (0.59)	−0.74	0.10	3.95 (0.52)	−0.59	0.66
Post-Intervention (T1)						
	Mean (SD)	Skewness	Kurtosis	Mean (SD)	Skewness	Kurtosis
CEPS	4.31 (0.48)	−0.84	1.25	4.05 (0.72)	−1.18	0.81
NEP	3.91 (0.58)	−0.68	0.42	3.58 (0.84)	−0.87	0.09
CEP	3.90 (0.61)	−0.65	0.16	3.91 (0.57)	−0.94	1.03

1 CEPS = Children's Environmental Perceptions Survey; NEP = New Ecological Paradigm; CEP

= Children's Ecological Behavior.

7. DISCUSSION

By increasing their understanding of the environment and strengthening their connection with the natural world, children are greatly impacted by environmental education programmes that are grounded in nature. Immersive outdoor experiences are associated with a more favourable attitude towards the environment and a greater feeling of responsibility to protect it, according to research. Children who spend time in nature daily are more likely to embrace eco-friendly lifestyle choices as adults, and this connection helps to cultivate that dedication. Researchers may successfully foster environmental consciousness and promote responsible behaviours by including nature-based learning in the school curriculum. Experiential learning is crucial in fostering a dedication to sustainability and environmental protection that lasts a lifetime, according to the data.

8. CONCLUSION

In conclusion, children's environmental understanding is much improved and a stronger bond with nature is nurtured via environmental education that is centred on nature. The development of environmentally conscious attitudes and the promotion of sustainable practices depend on this link. Educational programmes that include outdoor, experiential learning are more likely to succeed in raising students' ecological consciousness and encouraging them to become environmental stewards. Research highlights the importance of nature-based education as a component of successful environmental education initiatives, as it provides students with immersive experiences that are crucial for developing responsible and environmentally aware generations to come.

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