



Enhancing Education: The Benefits of Gardens, Plants, and Green Spaces in School Classrooms

As modern schools increase their technological literacy, a balance of digital spaces with natural spaces is of growing importance. Integrating nature into classrooms, particularly by incorporating gardens, plants, and green spaces, has gained considerable attention because of its educational, cognitive, emotional, and social benefits.

Academic Advancements

Integrating green spaces into schools and classrooms has shown that it can greatly enhance academic performance. Studies consistently demonstrate that exposure to nature can augment students' cognitive abilities, leading to better performance in various academic disciplines, including reading, writing, math, science, and social studies (Lieberman & Hoody, 1998). Additionally, school gardening activities can reinforce concepts learned across the curricula in a hands-on, interactive manner (Berezowitz et al., 2015). A recent systematic review has further corroborated the importance of green spaces, finding that nature exposure significantly enhances cognitive functioning, with particular benefits for attention and memory-related tasks (Vella-Brodrick & Gilowska, 2022)

Cognitive Benefits

Beyond simply improving academic performance, green classroom spaces are associated with considerable cognitive development. Exposure to nature has been linked to improved concentration, greater attention capacities, increased productivity (Kuo & Faber Taylor, 2004), and cognitive relief for highly anxious young individuals (Vella-Brodrick & Gilowska, 2022). Moreover, tending to plants within a classroom environment can promote observational and investigative skills, fostering a scientific mindset (Blair, 2009).

Nature Exposure and Cognitive Functioning

Based on a comprehensive review of 12 high-quality studies, there is substantial evidence that exposure to nature significantly enhances cognitive functioning in children and adolescents (Vella-Brodrick & Gilowska, 2022). Specifically, improvements have been noted in working memory, long-term memory, and sustained/selective attention (Vella-Brodrick & Gilowska, 2022).

Mechanisms Behind Nature Exposure Benefits

There is strong support for the restorative effects of nature on cognitive functioning. Frequent reports of improved attentional functioning and feelings of rejuvenation after nature exposure align with the Attention Restoration Theory (Kaplan, 1995), which suggests interaction with nature can have a positive impact on the effects of fatigue and poor concentration. This effect was not dependent on the nature of the intervention, such as outdoor play or merely observing nature from a window (Vella-Brodrick & Gilowska, 2022).



Age-Specific Impact of Nature Exposure

The cognitive benefits of nature exposure appear to vary by age. Younger children showed more cognitive benefits from physical activities in nature, while high school students gained advantages regardless of physical involvement (Vella-Brodrick & Gilowska, 2022). The call for more high-quality research involving primary school students to gain a broader understanding of nature's cognitive impact across ages is clear (Vella-Brodrick & Gilowska, 2022).

Emotional Well-being

The presence of plants and gardens in school settings has a significant positive impact on students' emotional well-being. Green spaces can reduce stress, help students relax, and boost mood (Chawla et al., 2014). In addition to these findings, recent reviews suggest that students report feeling restored and less stressed after nature exposure, providing support for the restorative effects of nature on cognitive functioning (Vella-Brodrick & Gilowska, 2022). Gardens can also provide therapeutic spaces for students with emotional and behavioral challenges (Ohly et al., 2016).

Well-being and Productivity

Indoor plants have been linked to various positive feelings and increased productivity. Studies have found that people feel more attentive when plants are present in the room (Lohr et al., 1996) and that the presence of indoor plants can make people feel more carefree, playful, friendly, and affectionate (Lohr and Pearson-Mims, 2000). Research has also found that productivity increases in the presence of plants. For example, in a study where participants were tasked with a visual concentration, mental processing, and manual dexterity task, reaction time was found to be 12% faster in the presence of plants, with no increase in error rate (Lohr et al., 1996).

Social Skills

Gardens and green spaces provide a conducive environment for social development. They foster cooperation, promote responsibility, and instill respect for nature and other people. Interestingly, nature exposure's benefits may be enhanced when shared with peers, suggesting a synergistic effect of social interaction with nature exposure (Vella-Brodrick & Gilowska, 2022). Furthermore, these environments can offer inclusive spaces for children with special needs, facilitating social integration (Dyment & Bell, 2008).

Promotion of Healthy Eating Habits

A garden-based integrated intervention was found to significantly enhance children's dietary habits and attitudes toward vegetables, contributing to overall health and well-being. The intervention improved dietary self-efficacy, outcome expectancies, gardening knowledge, nutrition knowledge, and vegetable preference, decreasing food neophobia (Int. J. Environ. Res. Public Health 2020, 17, 1257).



Health Improvement

There is evidence to suggest that indoor plants can also promote health improvements. For example, research has found that patients experiencing acute pain recover more quickly from surgery if they have a view of trees from their hospital room (Ulrich, 1984), and pain tolerance is increased among people in the presence of interior plants (Lohr and Pearson-Mims, 2000; Lohr and Pearson-Mims, 2008).

Why We Respond

Theories have been proposed to explain why humans respond positively to plants. These theories often invoke our evolutionary history, suggesting that we have developed in conjunction with nature, leading to innate responses to natural elements such as plants. For example, the Behavioral Ecology theory posits that we may have evolved to recognize cues associated with high-quality habitats (Balling and Falk, 1982; Orians and Heerwagen, 1992).

Conclusion

Incorporating gardens, plants, and green spaces into schools and classrooms can substantially enhance the quality of education by not only enhancing academic learning but also supporting holistic child development. It encourages the move toward an educational approach that values connection with nature, collaboration, and student well-being. As research continues to explore the extent of these benefits, it becomes increasingly clear that strategies promoting nature exposure should be a central component of educational policy and practice.



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