

Sustaining Education for Children's Pro-Environmental Behaviour on Plastic Waste

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Abstract

Results obtained using adapted environmental paradigm scales to measure the human-nature relationship indicate that environmental education has a positive impact on students. This suggests that environmental education is a suitable mechanism for achieving desired social outcomes. It appears evident that interventions aimed at fostering environmental habits at an early age play a significant role in the development of environmentally conscious attitudes and behaviours.

Although educational programs are recognized as powerful tools for mitigating the environmental impact of human activities, rapid shifts in societal values regarding the priorities of education in promoting sustainability can alter the effectiveness of this process. Today, plastic waste and the resulting environmental pollution constitute a global issue stemming from excessive production and consumption alongside inadequate waste disposal systems; consequently, the role of environmental education in encouraging eco-friendly behaviours regarding plastic consumption and waste disposal has become increasingly important. Environmental education is known not only to provide information on the importance of behavioural change but also to support the formation of personal norms and foster lasting changes toward eco-friendly behaviours.

Studies indicate that interventions targeting children to reduce plastic consumption can guide students toward more conscious plastic usage. It is acknowledged that interventions aimed at altering attitudes and norms during childhood play a crucial role in promoting pro-environmental behaviours. Accordingly, it has been concluded that knowledge-based interventions can encourage eco-friendly practices that minimize the environmental impact of human activities.

Keywords: Environmental education, waste management, plastic, behaviour

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1. Introduction

Environmental education contributes to the development of positive perceptions and attitudes toward nature by providing individuals with the knowledge necessary to better understand the causes and consequences of environmental problems. Interventions based on knowledge and positive environmental experiences encourage eco-friendly practices that minimize the impact of human activities on the environment. However, it is a fact that it takes a long time for educational programs to effect behavioural changes in individuals and society. Consequently, evaluating how behavioural changes evolve through educational programs requires a systematic timeframe.

It is widely acknowledged that the process of shaping environmental attitudes and behaviours begins at an early age (Sutter et al., 2019) and that children exhibit their own unique eco-friendly preferences and behaviours (Dewey, 2021). Therefore, our early experiences and the lessons we learn have the potential to influence our environmental values throughout our adult lives.

2. Families and Schools in Environmental and Waste Education

Family-based socialization is highly effective in the learning process and exerts a significant influence on visible eco-friendly practices, such as plastic usage and waste management. Therefore, encouraging joint activities between parents and children within the home environment is considered crucial for strengthening the intergenerational transmission of personal environmental norms and environmental awareness.

It can be stated that interventions aimed at fostering environmental habits at an early age play a significant role in the development of environmentally conscious attitudes and behaviours (Kosse et al., 2020). Research indicates that interventions and measures based on education and environmental knowledge are effective tools

for encouraging changes in individual behaviour (Hartley et al., 2018; Jaime et al., 2023). Environmental education has been shown not only to contribute to behavioural changes in individuals and society but also to foster lasting shifts toward eco-friendly behaviours (Huber et al., 2018).

Studies have found that energy and environmental education programs incorporating visualization—implemented at the primary and secondary school levels—positively influence children's awareness of efficacy; furthermore, this awareness has been shown to foster the positive development of environmental values at both individual and societal levels (Hiramatsu et al., 2014).

Although educational programs are recognized as powerful tools for mitigating the environmental impact of human activities, concerns regarding their actual effectiveness have arisen. First, it is suggested that it may take years for educational programs to bring about behavioural changes. Consequently, evaluating whether a behavioural change actually resulted from a specific educational program would require a costly, long-term undertaking (Thomson et al., 2003).

The primary objective of educational programs is often to equip future generations—by focusing on children—with the skills to contribute to an ecologically sustainable future. While this strategy is valuable and necessary, it fails to address today's critical environmental problems; in such instances, there is an urgent need for parents and grandparents to exhibit behavioural changes (Duvall & Zint, 2007).

Although educational programs are considered powerful tools for mitigating the environmental impact of human activities, the effectiveness of this process may be altered by rapid shifts in societal values regarding the role of education in promoting sustainability (Smith & Stevenson, 2017). Variations in personal lifestyles pose significant challenges to the implementation of ideal environmental programs. Despite the fact that environmental education effectively increases knowledge regarding the root causes of environmental waste issues, difficulties remain in designing programs that foster tangible, positive changes at the individual level.

3. Plastic Waste and Its Impacts on Environmental Pollution

Plastic waste constitutes a significant environmental and development issue when considering plastic pollution in the oceans and its adverse effects on the environment and the health of all living organisms, particularly marine life. Plastic waste—and the resulting environmental pollution—is a global problem stemming not only from excessive plastic production and rising consumption but also from inadequate waste disposal systems. Consequently, environmental education plays a crucial role in promoting eco-friendly behaviours regarding plastic consumption and waste disposal.

The non-biodegradable nature of plastics exacerbates the environmental threat they pose, as they persist in the environment for extended periods (Zhang et al., 2021). Improper disposal of this waste leads to accumulation in urban areas, clogging of sewage systems, threats to wildlife, soil contamination, and the degradation of the aesthetic appeal of water bodies and coastlines. The widespread use of single-use plastic packaging has become increasingly common in recent times. Research indicates that concerns regarding the consequences of plastic pollution extend beyond general environmental worries, encompassing harmful effects on ecological balance, human health, aquatic and terrestrial ecosystems, and marine biodiversity (Heidbreder et al., 2019).

Reducing plastic consumption can be guided by encouraging positive behavioural changes in children. It is possible to intervene by implementing specific restrictions for children and subsequently evaluating the outcomes of these interventions. By examining the factors that determine the positive or negative effects of the sanctions initially imposed on children, findings can be used to guide students toward more positive plastic usage habits.

Plastic waste pollution is a significant global environmental issue requiring comprehensive management strategies, and stakeholder perceptions and behaviours play a decisive role in shaping waste management practices. Most initiatives integrating environmental issues into the daily operations of educational institutions are voluntary in nature and, consequently, reflect a decision-making process ultimately influenced by the school's unique characteristics. Many studies addressing the impacts of education rely on a single

implementation framework or the assumption that annual returns are equal across different educational levels—a highly restrictive assumption (Salazar et al., 2024).

Researchers have found that students who receive environmental education exhibit higher levels of environmental literacy, and that schools involved in such programs demonstrate superior environmental performance. These studies evaluate the impact of school participation in environmental programs on children's eco-friendly behaviours, often comparing pre- and post-program behaviours and attitudes or contrasting different groups (Spinola, 2015).

Results obtained using environmental paradigm scales—adapted to measure the human-nature relationship—indicate that environmental education has a positive impact on students. This suggests that environmental education is a suitable mechanism for achieving desired social outcomes (Manski and Sjöström, 2002).

Encouraging eco-friendly behaviours early in life is important; evidence suggests that environmental education programs targeting school-age children can influence their values, thereby altering their habits regarding the consumption and disposal of plastic waste. Accordingly, environmental education fosters positive attitudes toward nature and promotes eco-friendly practices by providing the knowledge necessary to better understand the causes and consequences of environmental issues, such as plastic pollution. This knowledge, along with the resulting attitudes and practices, can contribute to minimizing the environmental impact of human activities.

Environmental knowledge, attitudes, and practices contribute to minimizing the impact of human activities on the environment and can be viewed as part of a broader strategy to increase positive, sustainable environmental practices. Well-designed environmental education can have a significant impact on children's eco-friendly behaviours regarding plastic consumption and waste management—particularly in situations where they have greater decision-making autonomy, such as choosing the contents of their lunchboxes.

4. Conclusion and Recommendations

There are various ways to encourage individuals to adopt more sustainable consumption behaviours; standard monetary incentives, such as taxes and bans, are among the common approaches. In situations where access to economic instruments is limited, information campaigns designed to influence individuals' attitudes, norms, and—ultimately—behaviours play a crucial role. It is widely acknowledged that the process of shaping attitudes and norms begins at an early age and that children exhibit eco-friendly preferences and behaviours (Dewey, 2021).

There is ample evidence that interventions aimed at modifying attitudes and norms during childhood play a key role in fostering pro-environmental behaviours. From a public policy perspective, the most effective way to encourage pro-environmental choices is to integrate environmental education into the school curriculum. Research indicates that educational campaigns and other information-based interventions are effective tools for promoting changes in individual behaviour (Jaime et al., 2023).

Environmental education contributes to the development of positive perceptions and attitudes toward nature by providing individuals with the knowledge needed to better understand the causes and consequences of environmental issues. Such knowledge-based interventions promote eco-friendly practices that minimize the impact of human activities on the environment. Environmental education not only provides information on the importance of behavioural change but also supports the formation of personal norms and fosters lasting changes in eco-friendly behaviour (Huber et al., 2018).

Hiramatsu et al. (2014) found that energy and environmental education programs incorporating visualization at the primary and secondary school levels had a positive and significant impact on children's awareness regarding effectiveness. Given the role schools play in conveying knowledge and fostering awareness, a comprehensive understanding of educators' perspectives on waste management—and an appreciation of the environmental implications of plastic waste—would enable teachers to integrate relevant content into their teaching methods, thereby cultivating environmentally conscious students.

Plastic waste has emerged as an urgent global environmental issue due to its detrimental effects on ecosystems, human health, and socioeconomic well-being; evidence indicates that demographic factors play a pivotal role in

shaping individuals' attitudes and behaviours regarding plastic waste management. This highlights the importance of collective awareness and shared concerns within the community regarding the development of sustainable waste management practices, underscoring the need for collective action to address environmental problems. It appears essential for policymakers, educators, and community leaders to understand the dynamics of perceived collective action and to develop targeted interventions and strategies for collective action aimed at promoting sustainable waste management practices and reducing plastic pollution.

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